Items of Interest

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Index to Volume XXII.

Effect of Oxyphosphate Upon Living Pulps.

A Symposium by Leading Writers.

In an effort to solve the problem as to whether or not a phosphate filling acts injuriously upon living pulps, a question of great importance to every practicing dentist, the following letter has been sent to prominent men throughout the country, including teachers in the dental schools.

"Dear Doctor:—In some of our text books and in many articles throughout our literature, the claim has been made that, if oxyphosphate cement be placed in a deep cavity, death of the pulp is liable to ensue.

"It seems about time that some of the myths of dentistry should be cleared up, or else the alleged facts should be substantiated. Will you contribute to a discussion on this subject by answering the following?

"Do you believe an oxyphosphate filling in a deep cavity carries danger to the pulp? If so, will you explain how it is that the pulp is destroyed—whether by chemical action, or by the mere juxtaposition of a foreign body? If by chemical action, will you explain what this action is, and how it operates from a mass as dense as oxyphosphate?

"If you do not believe that an oxyphosphate filling is dangerous to pulp vitality, could you account for the dead pulps reported, upon the theory that the pulp, prior to the insertion of the filling, was either so diseased or else so closely approached that it would have died under any sort of filling?"

Some of the replies follow:

Deleterious Action by Oxyphosphate Improbable.

Prof. Edward C. Kirk, University of Pennsylvania.

I am quite familiar with the claim, so often made, that an oxyphosphate filling placed in a deep cavity will act as an irritant to a healthy pulp, and may eventually bring about the death of that organ. I am quite

willing to admit the possibility of such a result, buf I am not so clear as to the essential cause—namely, that pulp irritation and death in these cases is more likely to occur under an oxyphosphate filling than under any other kind of a filling in cavities of the same relative proximity to the pulp. In fact, I am largely of the opinion that death of the pulp in these cases is due to the near approach of caries to the pulp, rather than to chemical irritation from the oxyphosphate filling, or as otherwise expressed, pulp death would be as likely to occur under any filling where the pulp was as nearly approached. Oxyphosphate has a questionable record in these cases, because it is usually resorted to as a filling material only in cases of deep seated caries, and the record of pulp deaths in such cases would necessarily be much larger than in cavities suitable for treatment by metallic fillings.

It is true that two possible sources of irritation from oxyphosphate are to be considered apart from its physical properties, namely—those arising from the irritating character of certain of its component materials. These are free phosphoric acid and arsenic.

Action of Phosphoric Acid.

It is a well known fact that chemical union of the powder (zinc oxide) and the liquid (one of the various modifications of tri-basic phosphoric acid) does not take place immediately, and is complete only after the lapse of a considerable period of time, often a number of hours, and until absolute union between acid and powder has taken place, there is always some free acid in the mass.

Proof of the imperfect nature of the chemical combination in the early stages of the mix may be found by two simple tests, first, the physical one of the dynamometer, which will show for a number of hours a gradually increasing resistance to crushing stress. Secondly, if before chemical combination is complete, and during the period when resistance to stress is rising to a maximum, the mix or pellet be placed upon the surface of moistened blue litmus paper, a distinctly acid reaction will be manifested by the formation of a red spot at the point of contact. The phosphoric acid liquid is in a highly concentrated solution, which is markedly hygroscopic, which latter quality every dentist knows by experience of the manner in which his bottle of cement liquid will abstract the moisture from the atmosphere during the damp weather of the summer and early autumn. With these properties of the acid in mind, it is quite conceivable that the avidity for moisture of the uncombined acid in a newly placed oxyphosphate filling might lead to its osmosis in the dentinal structure, causing disintegration of the dentine and possible irritation of the pulp in cases of near approach to that organ.

Presence of Arsenic.

I have alluded to the occurrence of arsenic in the cement powder. It is likewise a well-known fact that nearly all commercial preparations of zinc oxide contain slight quantities of arsenic, this latter element being constantly associated with zinc ores in nature, very few zinc producing regions being free from it, though I may say in passing that the zinc of New Jersey produced from the Franklin mines is said to be like the applejack of the same State, exceptionally pure and free from deleterious contamination.

Dr. Vernon Hall has recently drawn attention to the common occurrence of arsenic in cement powders, but Dr. W. V. B. Ames, of Chicago, has, in commenting upon Dr. Hall's observations, drawn attention to an important fact in relation thereto, namely, that, under the circumstances governing the manufacture of cement powders, viz., the high heat to which they are subjected in the calcination process, the arsenic enters into combination with the zinc, forming zinc arsenite, rendering the arsenic fully inert, just as arsenic when swallowed is rendered inert by the formation of iron arsenite, by the administration of freshly prepared moist ferric oxide as an antidote.

Under these circumstances, I am inclined to the belief that the presence of arsenic discoverable in minute quantities in cement powders may be disregarded so far as any deleterious effect upon dentine or the pulp is concerned where such powders form the basis of zinc oxyphosphate fillings.

Do not understand me as asserting the foregoing dogmatically. I have merely endeavored to answer the inquiry from my general knowledge of the subject, and my opinion would be subject to entire modification should the results of carefully conducted experiments bring to light other data affecting the problem under consideration.

We need some carefully conducted research along these lines in order to clear up a number of important features, concerning which we are at present very much in the dark and to give us a rational basis of practice.

Oxyphosphate Not Injurious to Unexposed Pulps.

PROF. JONATHAN TAFT, University of Michigan.

I do not believe that the oxyphosphate fillings affect living, healthy pulp that is not exposed, and is covered with a layer of unchanged dentine, having a thickness of thirty to thirty-two Stubbs' gauge. Such layer is not susceptible of measurement by this means, but I mention it

merely as an approximation. The pulp cannot be affected by the phosphoric acid unless it penetrates the covering of the pulp. The readiness with which this may be done would depend upon the thickness of the covering, and the presence of free phosphoric acid.

After the mass has undergone the hardening process, there is not, if proper precautions have been used, enough free phosphoric acid to cause any injury.

The susceptibility of the pulp to irritation is a feature that must not be overlooked. In cases of good constitutional health and vigor, the pulp resists irritants in a marked degree, while in others it is very easily irritated. Pulps are sometimes exposed through almost imperceptible openings, through small projections from the pulp chamber. Great care should be exercised that this condition does not exist in any case. In treating cases where there is a suspicion of a liability to disease, most thorough examination should be made, and a thorough knowledge of the condition attained. The density of the dentine should be taken into account. In many cases it is very dense and resistant, and in others, lacking this quality in a marked degree. If the pulp shows irritation, before filling an intervening substance may be used, as a thin layer of gutta percha or Hill's stopping, or a solution of either may be used as a varnish. This, or some similar procedure will serve as a good protection. There is, perhaps, no department of dental practice where there is more faulty work than in the management of exposed pulps, or those not properly protected by a substantial covering of the normal tissues.

The fact should not be overlooked that, in a great many susceptible cases, the pulp becomes affected early after the attack of decay, which has penetrated the dentine a considerable distance. A thorough knowledge of the subject, together with sharp discrimination, should be exercised in the cases where the welfare of the pulp comes in question.

A Completed Oxyphosphate Filling Is Non-Irritant.

Prof. George Edwin Hunt, Indiana Dental College.

I regret that I am compelled to preface my remarks with the admission that my knowledge on this subject is purely empirical. We have all had our clinical experiences, and it is from these that I draw my theories and deduct my conclusions.

While it cannot be denied that some of the reported dead pulps under the conditions cited were either so diseased or else so closely approached that they would have died under any sort of filling, yet to my mind it seems clear that neither previous pathological conditions nor the proximity of a substance so non-irritating and so unsusceptible to ther-

mal changes as a completed oxyphosphate cement filling will account for all of the cases met with in practice.

By a completed oxyphosphate filling, I mean one in which crystallization of the molecules has been perfected, and in which the chemical action incidental to "setting" has ceased. In my opinion a completed oxyphosphate cement filling is non-irritant. Any deleterious action which a cement filling may have on the pulp tissue takes place before this chemical action ceases.

Excess of Liquid Possibly Injurious.

The liquid in the cement is the disturbing factor. Some cement liquids are more acid, and, I believe, more irritant than others. While I have never made the experiment, I will venture the assertion that glacial phosphoric acid in juxtaposition with the living pulp will create serious inflammation. If this be true, the phosphoric acid in the plastic mass will irritate the pulp in direct proportion to the quantity present. As it is necessary to use the cement in an uncompleted or plastic form, it is impossible to avoid this untoward effect.

In this connection a thought occurs to me which might serve as a basis for an investigation. It is a well-known scientific fact that a certain quantity of the liquid is necessary to properly affect a given quantity of the zinc oxide. In other words, the molecules of the powder and of the liquid combine in a definite ratio. Since this is so, if an excess of liquid is used, what becomes of it? Is completion of the filling delayed until this excess has been slowly given off, which, by penetration, may affect the pulp? How long does chemical action continue in the cement if an excess of the liquid be used? It takes something more than theorizing to answer these questions, but when the truth is known it will not surprise me to learn that in many cases the chemical action incidental to the completion of the filling is of some days' or perhaps weeks', duration, and that, in the interval, minute quantities of free phosphoric acid are being driven off. During this time these will produce a low grade of irritation highly calculated to depreciate the vitality of the delicate pulp tissue to the point of cessation of function. And the closer the cement approaches to the pulp the greater the certainty of the result and the quicker it will be accomplished.

Oxyphosphate Endangers the Pulp.

PROF. M. C. MARSHALL, Marion-Sims College of Medicine, Dental Department.

Concerning the action of oxyphosphate fillings in deep cavities, I think these fillings do carry danger to the pulp. The pulp can be, and I think sometimes is, destroyed by the action of the phosphoric acid.

Wherever the layer of dentine is thick enough to limit the action of the acid to such an extent that it does not reach the pulp, this organ is still in danger from thermal shock, and I am satisfied sometimes dies under its influence.

If the conductivity of oxyphosphate be arbitrarily accepted as 584, gold being 1,000, many will be deceived. It has been my observation that the condition of the dentine is a controlling factor whether hypersensitive or not, and must be considered before placing oxyphosphate close to a pulp.

If there is very little sensitiveness, as we frequently find, and the pulp is healthy, the danger is greatly diminished both from the chemical action of the acid and the conductivity of the filling.

The ratio of deaths of the pulp under oxyphosphate fillings is so much greater, in like cavities, than under gutta percha, that the mere fact of juxtaposition of a foreign substance will not account for it.

Injury Occurs Early If At All.

PROF. ALFRED R. STARR, New York College of Dentistry.

I believe the principal danger to a pulp from the use of zinc phosphate is immediate and not long deferred. The mass while plastic is irritating because of the phosphoric acid in the combination. I do not believe it is intolerable to the pulp after it has crystallized.

We are told that the zinc oxide may contain arsenic as an impurity, and if such be the fact it would no doubt account for some of the cases of devitalization under a zinc phosphate filling. I believe that the severe irritation caused by placing ordinary zinc phosphate paste over a pulp nearly or quite exposed may eventuate in the death of that pulp; so for that reason, in the cases just mentioned, I dilute the phosphoric acid with water, clove oil or some non-irritating antiseptic solution before mixing with the zinc oxide.

If a healthy or unexposed pulp be capped in this manner, the immediate irritation is slight or nil, and I do not consider that the pulp is any more prone to die under a capping of that kind than under any other material of the same or about the same degree of thermal conductivity.

I have said nothing about protecting the dentine with varnish. Unfortunately, I know very little about chemistry, but plain horse sense would lead one to infer that if any deleterious results are due to chemical action, that action must take place prior to complete crystallization, or during, or subsequent to disintegration of the material.

Opinion of Prof. G. V. Black, Northwestern University Dental School.

I have no sympathy with the opinion so widely held that oxyphosphate tends to destroy the tooth's pulp. I have had too much experience in capping pulps with oxyphosphate of zinc to think so, and have found that they live too well under this as a capping for me to suppose for one moment that there is anything in the oxyphosphate that is intrinsically obnoxious to the vitality of the pulp. I recognize that many pulps do die under oxyphosphate under conditions illy chosen for capping.

Opinion of Prof. John T. Hart, New York Dental School.

I most firmly believe that an oxyphosphate filling in a deep cavity carries danger to the pulp. My supposition is that the free acid (phosphoric) on the surface of the filling, during the interval between its placement and crystallization, is absorbed into the tubules and stimulates the pulp; some pulps react under the stimulus favorably, others become so congested that they strangulate by pressure at the apical foramen.*

(To be continued.)

*Further contributions to the discussion of this subject are cordially invited.—**Editor.***

An Interesting Case in Practice.

By J. Austin Bucknall, D.D.S., Detroit, Mich.

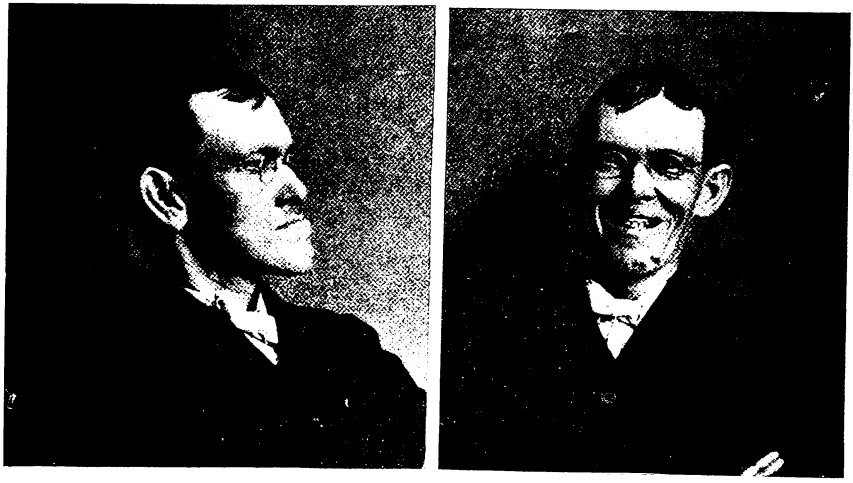
In April last Mr. H., age forty-three, presented himself at my office, and asked whether something could not be done for him. He explained by saying that two well-known local dentists had given him no encouragement, but looked on the condition of his mouth as hopeless. He was badly run down, and complained of stomach troubles.

Examination showed a fairly sound set of teeth, with the peculiar facial condition of which the accompanying cuts give only a poor idea. (Figs. 1 and 2). Notice the profile view. This had been a growing source of annoyance for the past few years. It was not normal, but was due to the loss of teeth when a young man. The lower teeth had slipped outside and past the upper incisors until the latter were touching the gums on the lingual surface of inferior incisors. The lips were deeply furrowed; the upper thin and shrunken, while the lower was thickened and pushed forward into a heavy lump when the jaws were closed. The whole appearance was unprepossessing, and especially annoying to a very bright and clever man. He remarked when the photos were taken that it was the first time he had cared to sit before the camera for many years.

Although badly neglected, the teeth were strong and healthy in their sockets. The six lower anterior had been filled along the gingivae with

amalgam. Otherwise there had been little decay for several years, due apparently to the preservative influence of the juice of the tobacco plant.

An appliance having a sliding plane was used to open and throw



FIGS. 1 AND 2.

FIGS. 3 AND 4.

back the lower jaw. It was shaped, too, to give the outer line of the articulation desired. I refer to the beautiful curves outlined by natural teeth, which I wanted to give as nearly as it was possible, considering the irregularity presented at the gingival line. No attempt was made with

the appliance to force the jaw back or shorten the inferior maxillary. A certain position was desired and kept in this way during the preparation of the work.

The worst obstacle encountered was caused by the upper anterior teeth having shifted from left to right, throwing the mesial line to one side, and each tooth had to be reduced on one side and extended on the other. The lower mesial line was just the reverse in direction.

In all twenty-two teeth were built up, preference being given to gold for molars, with porcelain jackets and logan crowns for bicuspids and an-

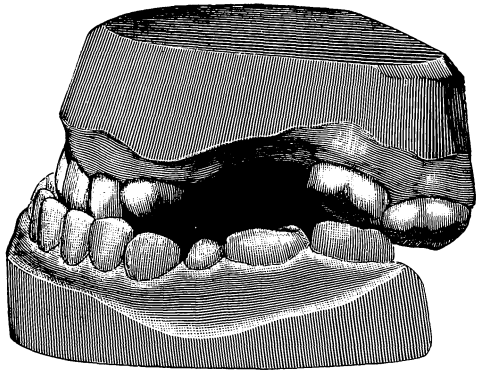


FIG. 5.

terior teeth. The amalgam fillings in anterior lower teeth were substituted with gold, the badly broken lateral being jacketed. As the upper wisdom teeth were brought into use in mastication by the change, they have been left undisturbed, although somewhat affected from want of attrition, and consequently diseased in the interproximal space.

All this work when completed was cemented in place at one sitting. Some annoyance was caused by pain in muscles of mastication due to change of position, but otherwise, since June, now a period of five months, there has been no trouble of any kind. The deep furrows in the lips have almost disappeared, while the heavy thickness of the lower lip has gradually returned to the normal condition of mobility. The photos taken after completion show the mouth slightly open, with teeth separated, to which I call attention, as it might be thought that the lips do not close together. (Figs. 3 and 4.)

Two spaces required bridges, as also another space caused by the ex-

traction of the upper right second bicuspid, which had pericemental troubles. The upper left lateral had been crowned, and was in the same condition, so was removed, and the bridge in the vicinity extended by a dummy lateral. (Figs. 5 and 6.)

Simplicity of construction for cleanliness, reduction of all bridges to as short a span as possible, together with complete isolation of each tooth, as much as possible, is the desideratum in such work, to get best results. The least strain or pull will produce inflammation around the tooth. Gold carried far below the gingival line will do the same. Carefully fitted caps placed on the teeth, and plaster impressions then taken, will eliminate strain. The little double impression tray is invaluable in such work, as we

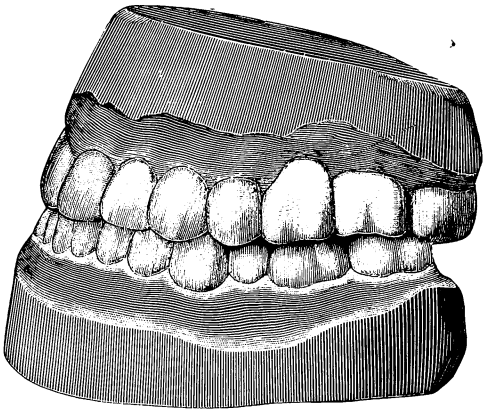


FIG. 6.

get the bite and can pour model and opposing teeth on small articulators, absolutely true. To prevent the caps dropping when fitting or taking impressions, the following method was followed.

After the band was made, fitted and contoured to desired shape, thin platinum was burnished over tooth and band put on. Modeling compound was then placed inside band, and the whole removed; 20 K. solder was then flowed into space between platinum and band; excess of platinum over tooth was torn away, and gold articulating surface added by Lowrey method.

A little point of value is to use pure gold instead of platinum for backing porcelain facings. Add a piece of 18 K. plate, bend pins with care, not tight down, invest and flow 20 K. solder, then put in place on bridge model, adding articulator cusps afterwards. Pickle all gold before soldering, and do not get borax on porcelain. Heat up with bunsen flame always before soldering.

SOCIETY PAPERS

Oral Embryology.

By I. NORMAN BROOMELL, D.D.S.,
Professor of Dental Anatomy, Dental Histology and Prosthetic Technics, Pennsylvania College of Dental Surgery, Philadelphia.

Read Before the New Jersey State Dental Society, July, 1899.

Before taking up the cellular stage of tooth development let us briefly consider the growth of those parts within which the phenomena takes place.

One of the earliest products of the mesoblast is that which results in the production of Meckel's cartilage, which, as is well known, is closely associated with the growth and early support of the lower jaw. In the beginning, as already pointed out, the mandibular and hyoid arches resemble one another, but soon after they become fully established they take on different functions and with this become dissimilar. About the first appearance of this cartilage as a distinct body of cells is found about the middle of the second month, and when a transverse section of the jaw is made for the purpose of studying its location and environments, see Fig. 16, it is found near the base of the fœtal head, considerably below and to the outside of the base of the tongue. At midjaw it appears as a circular body of cells separated from the surrounding parts by a distinct layer of elongated cells. Even at this early period a portion of the bony structure of the jaw is outlined by an aggregation of connective tissue cells, and the forming cartilage appears to subserve the purpose of controlling the form of the future jaw. The bow-shape of the cartilage is manifest as we pass toward the symphesis by the lateral halves approaching each other, Fig. 17, but the circular character of the cartilage in cross section is still retained.

Fig. 18 represents a section through the symphesis about the eighth week, and shows the two halves of the cartilage closely associated but not united, the separation being by a layer of connective tissue cells passing between the two. It will be noted also that the cartilage instead of being near the base of the jaw as in Fig. 17, now appears near the floor of the mouth.

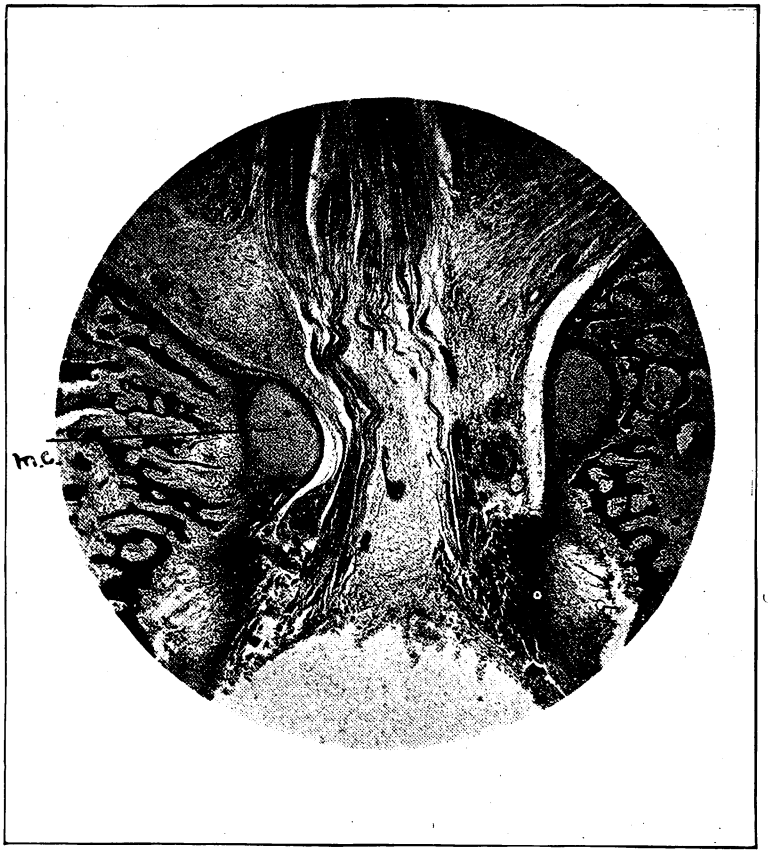


FIG. 16.—X 60.

Fig. 19 shows the relations existing between the two halves of Meckel's cartilage and the growing mandible at the median line (A). It also illustrates how little the development of the bone is dependent upon the cartilage, the growth of the former being in this district far below and apparently distinct from the latter. Here as in the upper jaw the

periosteal cells from either side are observed to unite at the symphesis and pass as a somewhat thickened layer between the two bones, the only difference in the final change which takes place between the two being, that in the upper jaw a suture results while in the lower, a layer of solid bone is formed.

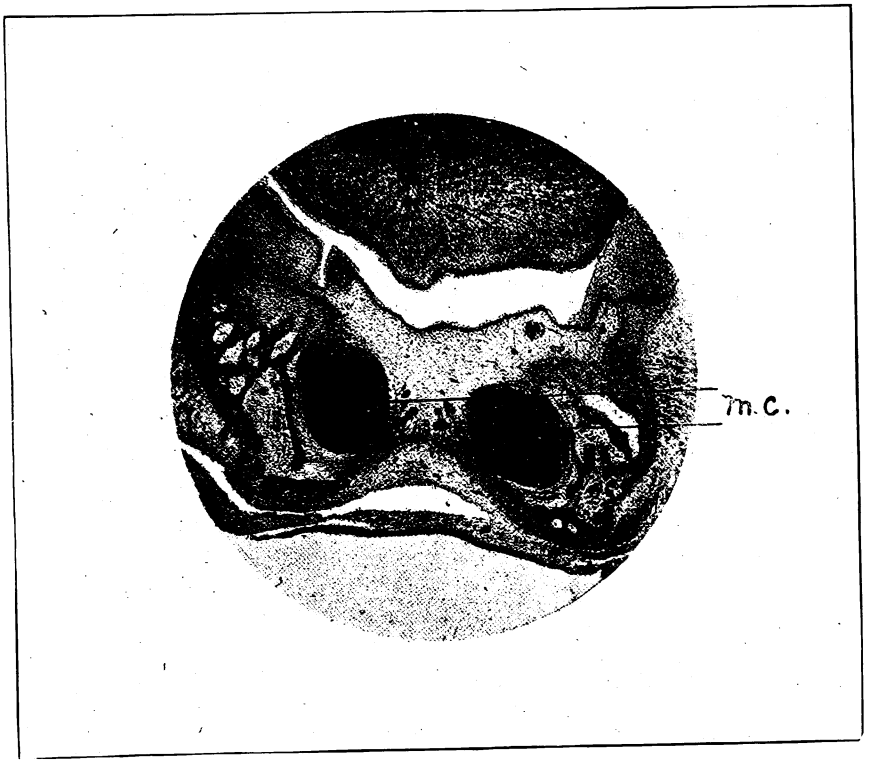


FIG. 17.—X 30.

The character of this cartilaginous framework as well as the cells which divide the two halves is shown in Fig. 20, the cartilage cells being oblong or cylindrical, with a bountiful supply of intercellular substance, while the connective tissue cells are oblong or spindle shaped.

As soon as ossification takes place to any extent in the jaw this cartilage begins to atrophy, that portion lying next to the jaw degenerating first, so that by the tenth or twelfth week it has entirely disappeared, but

before this takes place we find it surrounded by the periosteum of the jaw and finally completely inclosed within the bone.

Fig. 21 shows the character of the cartilage cells about the time that they are beginning to atrophy. It will be observed that the cells are inclined to a change in form, and that they are proportionately larger with large nuclei and nucleoli. A represents the district nearest the jaw and the cells in this region have already lost their characteristic outline.

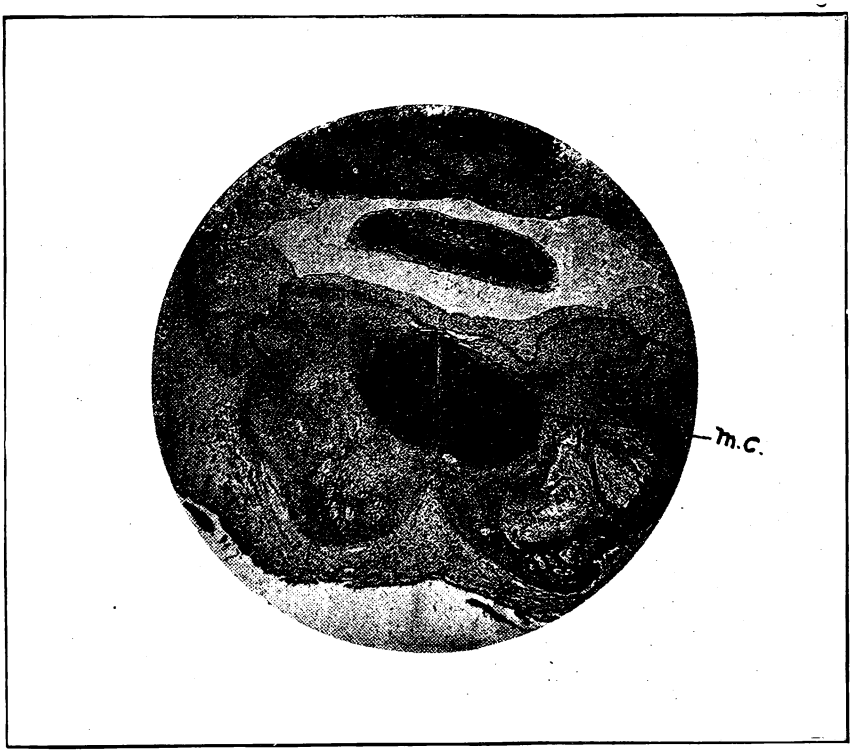


FIG. 18.—SECTION THROUGH LOWER JAW, X 30.

In considering the early stages of tooth development I am conscious of the fact that it is a subject that has been written and rewritten, but in this respect it is not unlike the majority of texts selected for dental literature at the present time. One phase of the subject to which I shall give special attention is that which denotes the period at which the various events take place. This is a part of the study which is very difficult to determine and it would appear for this reason if for no other, that inves-

tigators of recent years have been perfectly satisfied to accept the results arrived at by their predecessors without an apparent effort to qualify the deductions. It has for a long time been conceded that the primitive changes which ultimately result in the formation of a tooth germ are first noted in a heaping up of the epithelial cells over the district representing

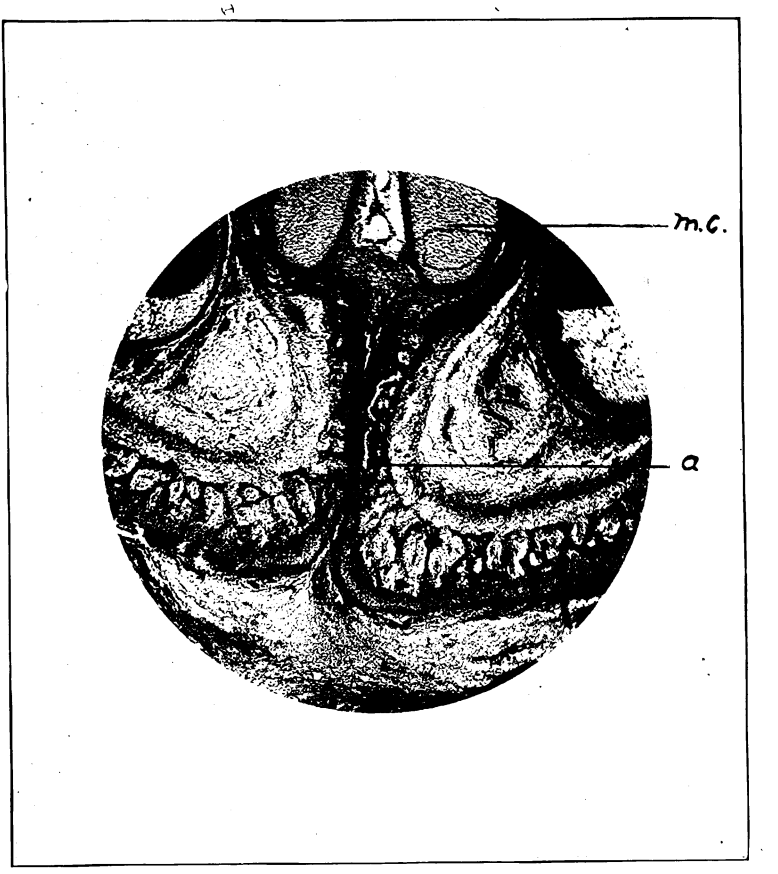


FIG. 19.—X 40.

the surface of the future jaw. While in many instances this is true, there are many reasons why it cannot be considered an essential feature. In the first place such a condition is not always present, as shown in Fig 22, a transverse section through the primitive jaw of a human fœtus at about the fortieth day. The tooth bands at A and B have penetrated the sub-

mucous tissue for a considerable depth, but the surface epithelium does not show a greater thickness at these points than it does over the general surface of the cavity.

Fig. 23 shows a section made in the same direction upon a human embryo about the sixtieth day, and while the tooth band (A) has penetrated the embryonal connective tissue to a greater depth there is yet no increase

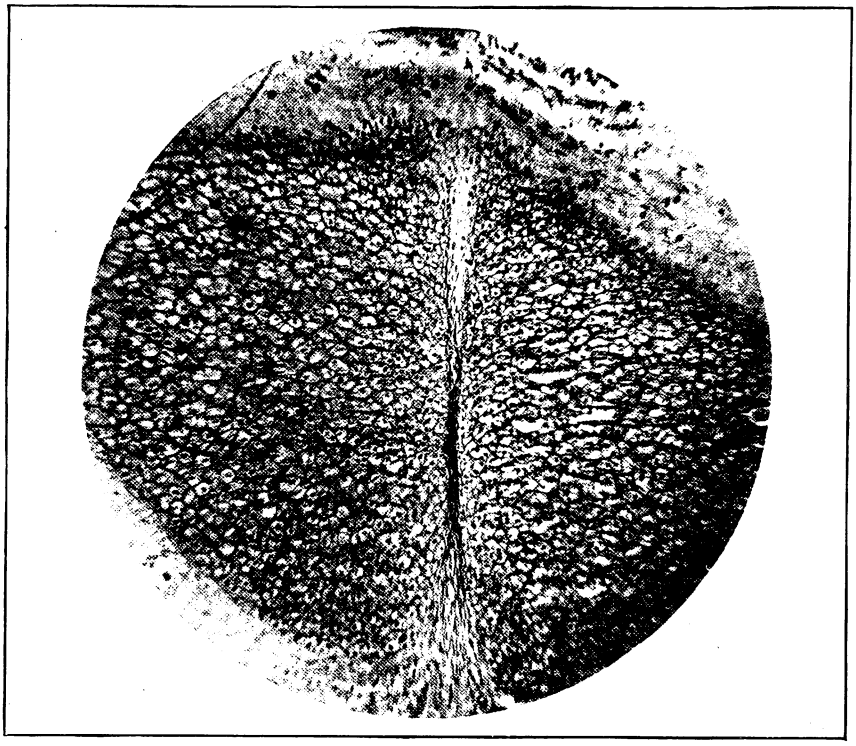


FIG. 20.—SECTION THROUGH MECKEL'S CARTILAGE AT THE MEDIAN LINE, X 300.

in the thickness of the epithelium, but rather a disposition for the parts to become depressed. Another reason why the heaping up of the superficial layer of the cells forming the embryonal mucous membrane should not be considered the first sign of the preparation for tooth development, lies in the fact that these cells are not directly interested in the process, but that the inflection of cells which results in the formation of the tooth band, results from the deep layer of cells known as Malpighi's layer, as shown at (B) in Fig. 23.

There is no question in my mind but that the location from which the section is taken has much to do with the character and thickness of the older layer of epithelial cells, and that they do at certain periods constitute an epithelium far exceeding in thickness that of other parts of the cavity, but this condition most frequently occurs after the enamel organ has assumed definite proportions.

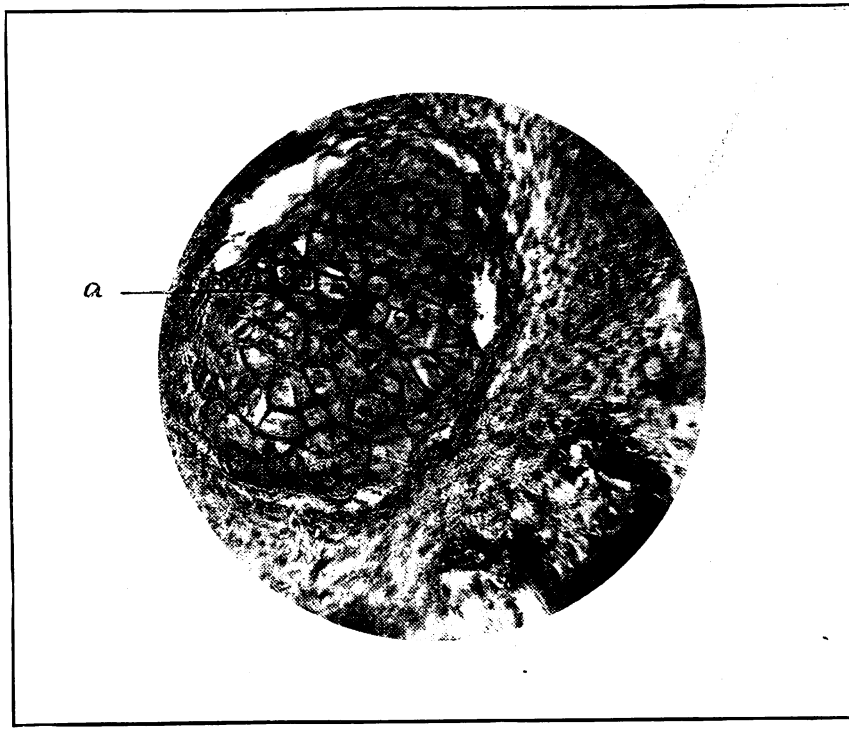


FIG. 21.—SECTION THROUGH MECKEL'S CARTILAGE, X 300.

After the formation of the tooth band which, it must be remembered, encircles the entire jaw in the form of a well defined body of oval epithelial cells from the infant layer, and shown at (A) in cross-section, Fig. 24, the next step in the process is one which concerns the location of the individual buds for the enamel organs of the various teeth, and the approximate time at which these appear.

In the human subject we find ten such spots appearing upon the face of the tooth band. These do not appear, however, at the free extremity of

the band, but at some little distance toward the surface from this point, as shown in Fig. 25. We observe also that the tooth germ has become severed from the surface epithelium, but this is not a true condition at this period, as it still retains its connection with the surface by a narrow band

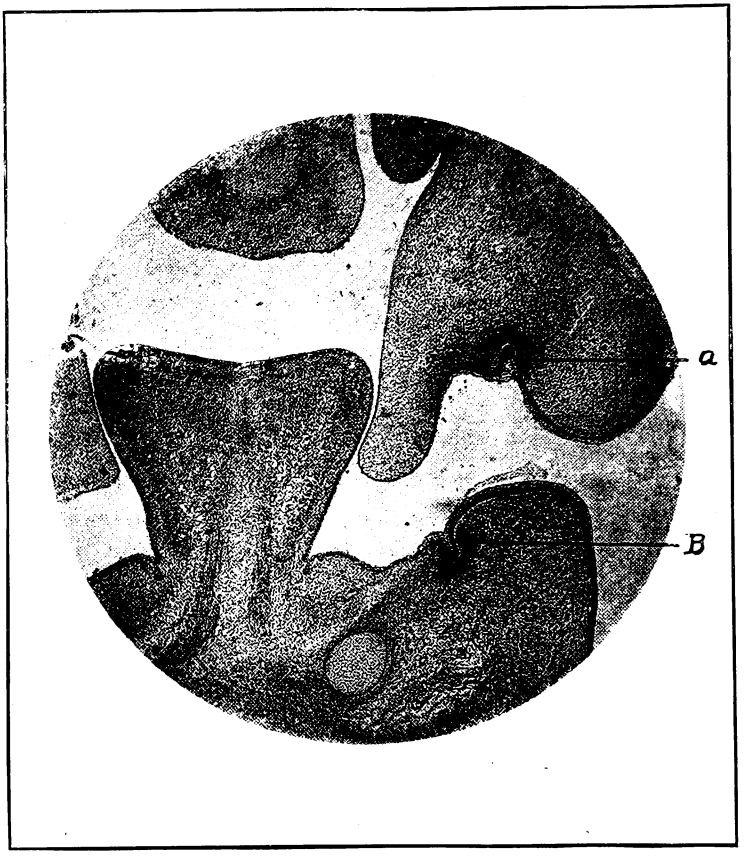


FIG. 22.—SECTION THROUGH ORAL CAVITY, 40 DAY, X 30.

of cells, the neck of the enamel organ. Two distinct classes of cells are now (sixtieth day) concerned in the process of tooth development, those at (A) being of epithelial origin forming the future enamel organ, while at (B) an aggregation of cells from the mesoblast provide for the generation of the dentine and pulp. At (C) the narrow band of cells which should continue to the surface are shown, while the free extremity of this

same body of cells at (D) will persist and eventually become the germ for the succeeding tooth. In regard to the time at which the buds for the various teeth appear we might expect the same variation which follows the development and eruption of the teeth throughout, but such is not the case, the buds for the deciduous incisors appearing about the sixtieth day, while the germs for their permanent successors are but little later in forming.

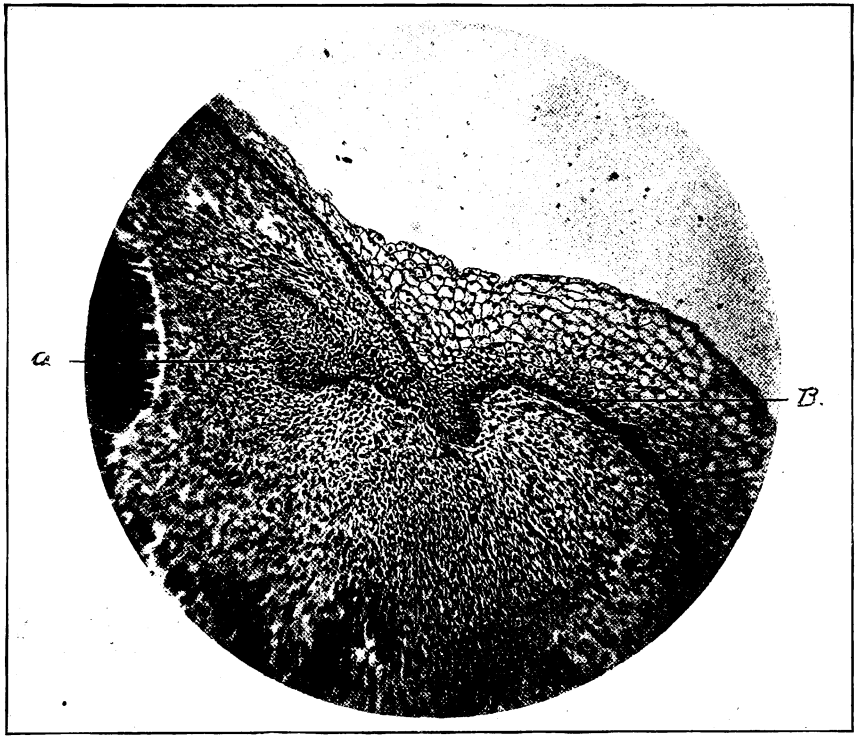


FIG. 23.—TOOTH BAND, HUMAN EMBRYO, 60 DAY, X 80.

Fig. 25 shows a longitudinal section through the lower jaw about the twelfth week, the deciduous incisor being well outlined by its formative cells, while immediately to the lingual appear a section of the germ for the permanent cuspid. Notwithstanding this there elapses a period of several years between the eruption of these teeth. The same relative progress will be noted between the first and second teeth be the subject human, requir-

ing many years to complete dentition, or in most of the lower animals in which the same process occupies but a comparatively short time.

The next stage in the development of a tooth to which I shall call your attention, is that in which the entire tooth crown is outlined by the dentine papilla and surrounded by its epithelial cap, the enamel organ.

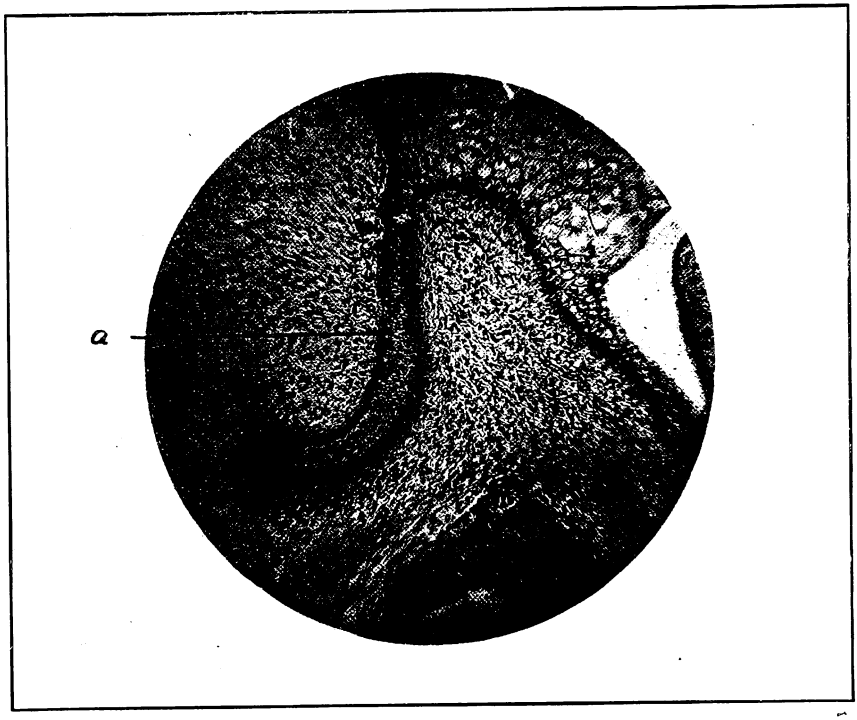


FIG. 24.—TOOTH BAND, HUMAN EMBRYO, 12th WEEK, X 100.

Such an advance in the process is shown in Fig. 26, together with the surrounding structure. When this stage is reached the individual cells of the tooth germs are strongly differentiated, and the odontoblasts are making their appearance about the summits of the cusps.

Up to this time the cells present are those which result in the formation of but two of the calcified tooth tissues, but now we notice at (A) a marked disposition upon the part of the periosteum of the jaw to pass

down by the side of the enamel organ, being the first indication of the formation of the tooth follicle, the pericemental membrane and cementum. At this period it will be observed that there appears in this, the molar region, a "heaping up" not only of the surface epithelium, but also of the submucous beneath.

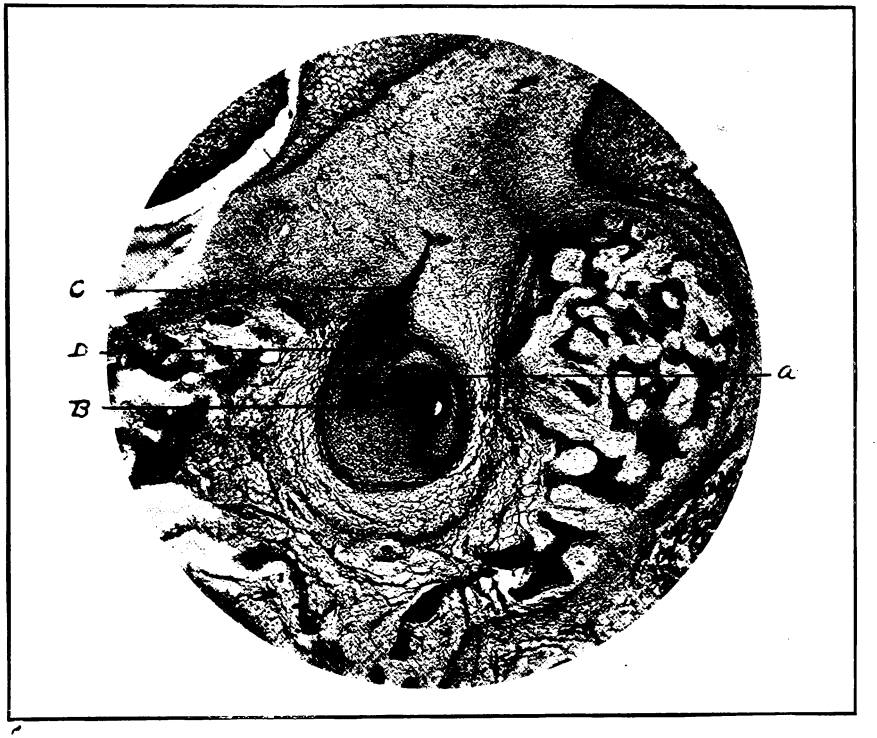


FIG. 25.—TOOTH GERM, SHEEP EMBRYO, X 40.

Fig. 27 shows a section through the growing mandible taken from a portion of the tissue not occupied by a tooth germ. It is interesting first as giving a view of the detached tooth band in cross-section at (A), second by showing the distribution of the periosteum to the interior of the jaw to serve the double function of the future tooth sac and peridental membrane, and thirdly the thickened epithelium with the underlying tissue pushing into it.

Although the germ for the second tooth may be observed at a period somewhat prior to this, a study of some of its characteristics is best made at this time. I have already referred to the fact that this interesting phenomena occurs soon after or even almost simultaneously with that for the first tooth, a portion of the primitive cord for the latter persisting as the germ for the former.

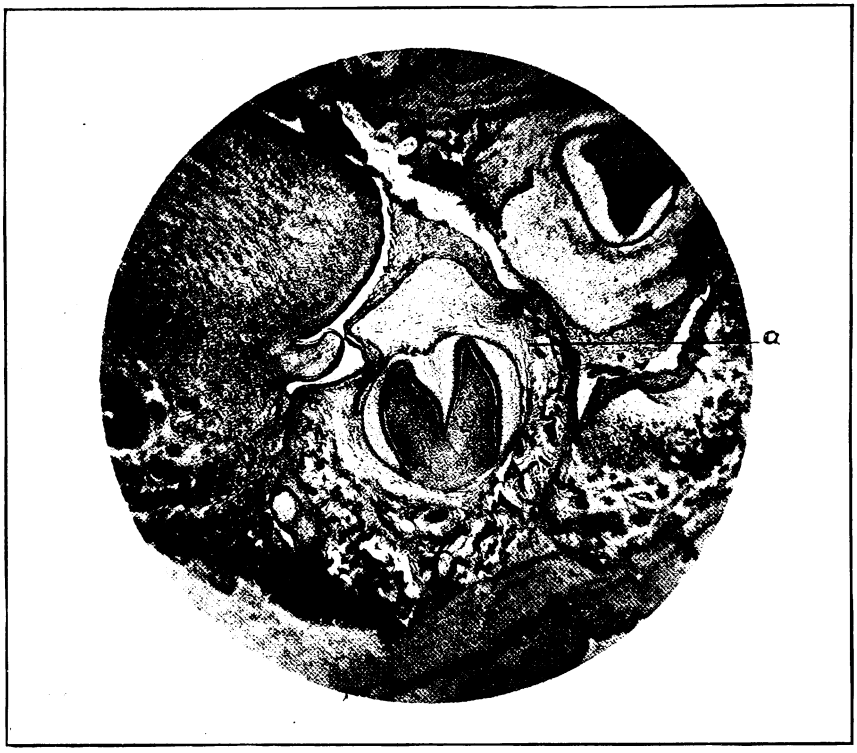


FIG. 26.—TOOTH GERM, PRE-MOLAR, EMBRYO LAMB, X 40.

In Fig. 28 the cells forming the primitive germ for the enamel organ of one of the permanent teeth is shown with a 1½ inch objective. It will be observed that the cells are of the simplest epithelial character, and that they are derived directly from the enamel organ of the pre-existing tooth on the one hand, while on the other they communicate with the surface by a narrow band of cells. In this way it is for a time dependent upon both of these parts for continuance and growth, but after a time it, too,

like its predecessor, severs its connection with the surface, but remains intact with the epithelial cells of the former enamel organ until these cells begin to atrophy.

The cells which make up this primitive germ are of three varieties; the inner layer, or those derived from the epithelium of the enamel organ of

FIG. 27.—SECTION THROUGH GROWING JAW IN A DISTRICT NOT OCCUPIED BY A TOOTH GERM, X 40.

the first tooth being small and spheroidal, those of the outer layer which spring from the surface epithelium being proportionately larger and cylindrical or oblong, while those which intervene are markedly irregular in outline. In this respect, that is, in the character of its early cell layers, the tooth germs for the permanent teeth differ from those of the deciduous.

The question of the origin of those teeth which have no predecessors is one upon which there has always been more or less discussion, some writers contending that they were derived directly from the oral epithelium by a special generation of cells for each tooth, while others were of the opinion that as the jaw grows backward certain changes take place which

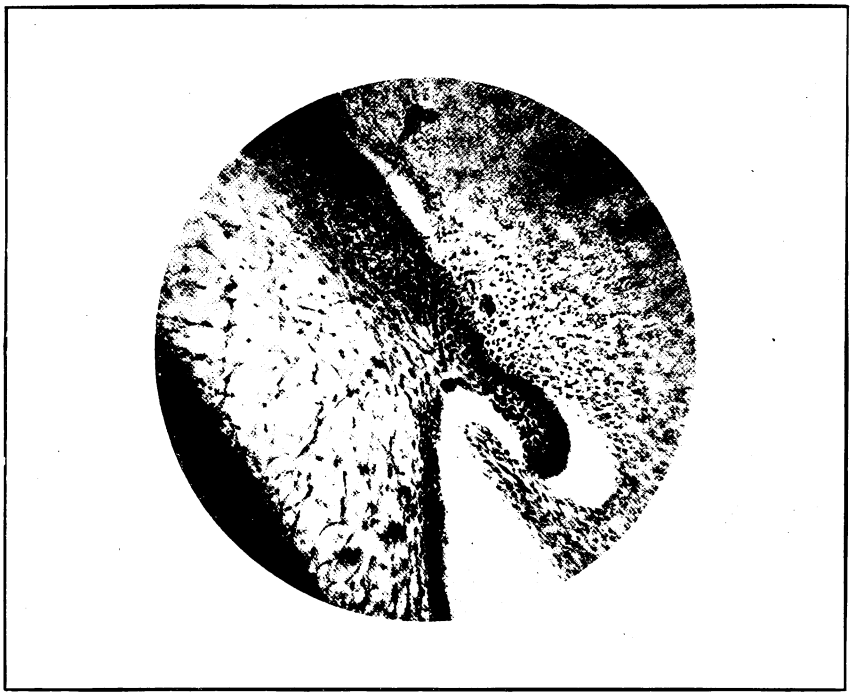


FIG. 28.—PRIMITIVE BUD FOR ENAMEL ORGAN OF PERMANENT TOOTH. HUMAN EMBRYO, X 300.

result in the establisment of an epithelial fold or lamina, in every particular corresponding to the tooth band of the deciduous teeth. With these two conflicting opinions in mind, a number of sections were made through the extreme distal end of the jaw, one of these being shown in Fig. 29, proving beyond a doubt that the latter theory is the correct one, for at (A) the tooth band is seen resembling in form and location that seen in the jaw in those locations producing succedaneous teeth.

Let us next pass to the process of calcification in the tooth tissues, the beginning of this interesting phenomena having been observed as early as the sixtieth week of fœtal life. I have shown the individual tooth made up of young cells from its earliest inception to the fully outlined crown, and immediately upon arriving at this latter stage the peripheral cells of the two primary organs become differentiated as odontoblasts and ameloblasts respectively.

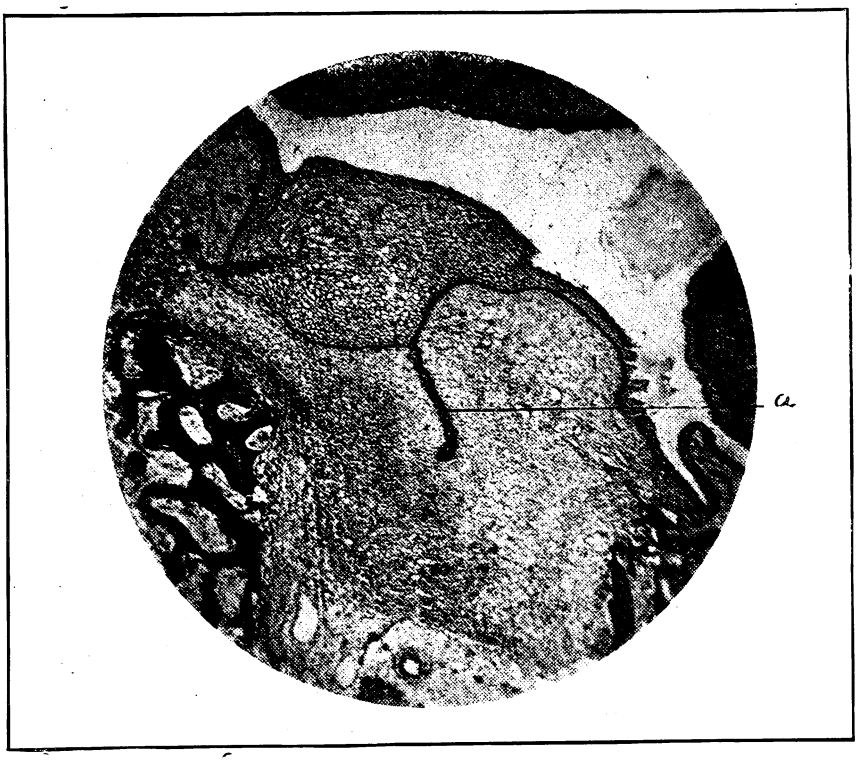


FIG. 29.—SECTION THROUGH DISTAL END OF JAW, SHOWING TOOTH BAND FOR THOSE TEETH HAVING NO PREDECESSOR, X 40.

The general character of the pulp cells at a time immediately prior to the appearance of the ameloblasts, is vastly different from the same cells at maturity or after calcification of the dentine has taken place. The reason for this is obvious, considering that the connective tissue mass does not assume its principal function until the odontoblasts are generated about its periphery. While at a later period the cells

of the pulp are spindle-shaped with slender tail-like processes given off from each end, we find the same cells in the early embryo (sixteenth to twentieth week) spheroidal in outline and distributed as they continue to be, at irregular intervals about the semi-gelatinous matrix. See Fig. 30.

When the periphery of the pulp is reached a definite layer of cells are present, corresponding in every particular to those of the interior, and it

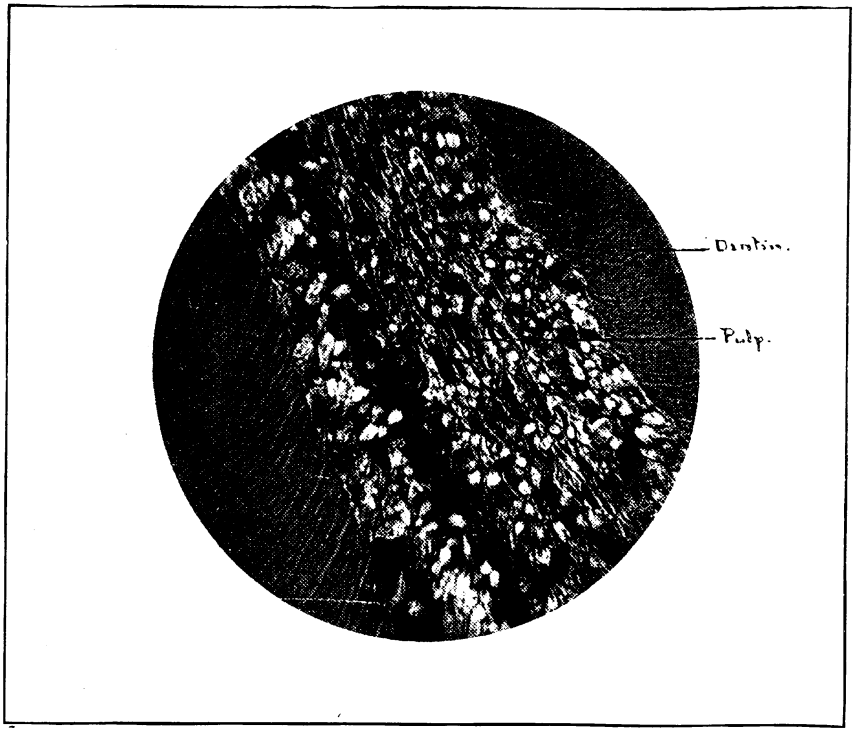


FIG. 30.—SECTION THROUGH PULP AND DENTINE, 16 TO 20 WEEK. HUMAN EMBRYO. X 100.

is from these spheric bodies that the dentine forming cells are derived. The odontoblasts are usually characterized as spindle or flask-shaped cells, but this can only apply to the cells of later life, as those active at the beginning of calcification do not partake of either of these forms. Fig. 31 (twentieth to twenty-fourth week) shows the first formed odontoblasts actively engaged in their function of dentinification. It will be observed

that the cells, instead of being individualized as they appear at a later period, now present a rasemos arrangement, such a cluster appearing about the entrance to each dentinal tubuli, which at this period are widely separated and apparently without anastomosing branches. The nearer we approach the summit of the crown the less of this grape-like association of the cells do we observe, showing conclusively that it is a primary condition.

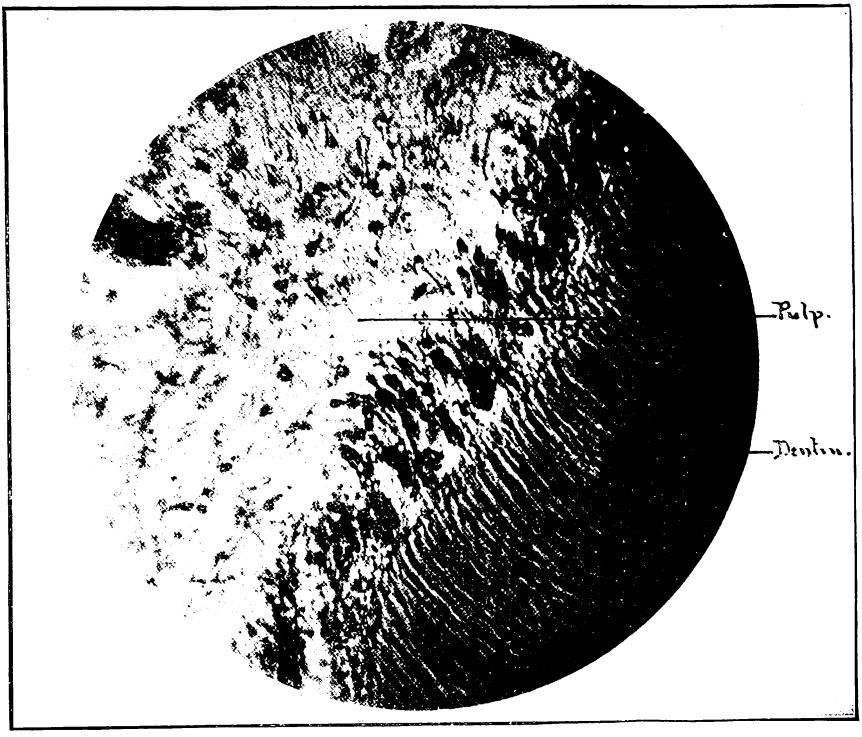


FIG. 31.—SECTION THROUGH PULP AND DENTINE, 20th TO 24th WEEK. X 200.

After a definite thickness of calcified dentine appears about the surface of the tooth pulp, the character of the odontoblastic cells becomes materially changed (twenty-fourth week), but even yet they do not answer to the description accorded them. The elongated, spindle-shaped or club-shaped odontoblasts are without question found in connection with the tissue only after calcification has progressed to a considerable extent, and while it does not appear possible to detect the minute processes which

penetrate the calcifying structure before this stage of the phenomena has been reached, they have nevertheless existed from the earliest inception of this specialized layer of cells.

In this connection the query presents itself in regard to the manner in which the intercommunication between the dentinal fibers is established, and the probable cause for the so-called interglobular spaces about

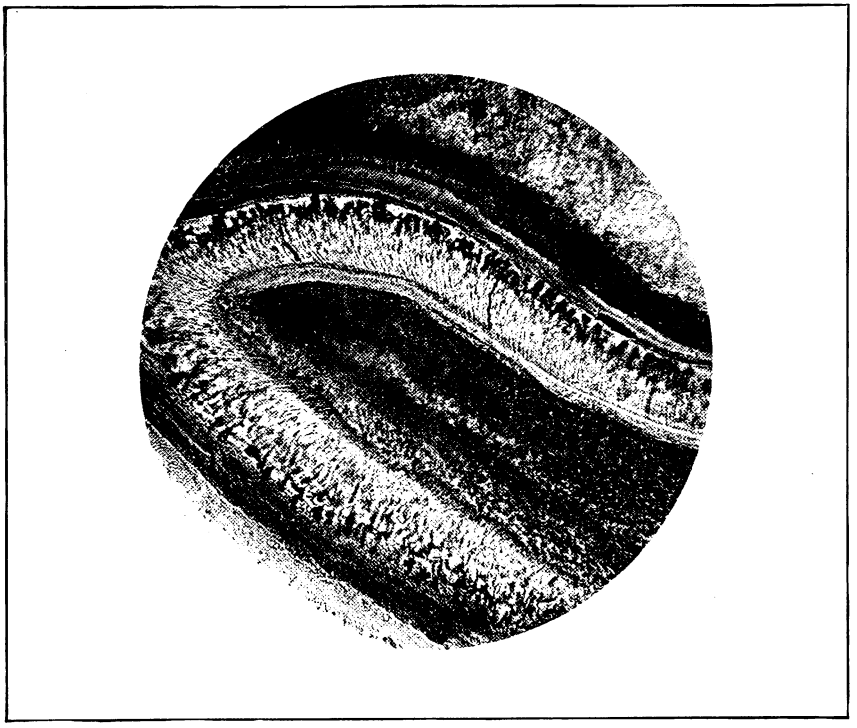


FIG. 32.—SECTION THROUGH LIPS OF GROWING TOOTH OF LAMB, X 60.

the periphery of the dentine. The former can probably be explained by an examination of the peripheral cells of the pulp at a time immediately prior to the beginning of calcification, when it will be found that these primitive odontoblasts communicate with one another in a manner quite similar to the canaliculi between the lacuni of true bone, the connecting processes being encapsuled within the substance of the calcifying tissue.

Fig. 32 is taken from a very thin section of a growing tooth at a time in which we would most naturally look for the appearance of the interglobular spaces, and many such imperfections, if they may be so named, are observed within the substance of the newly formed tissue, but the fact that these may be seen does not account for their presence, but there is little doubt in my mind but that they are the result of imperfect nutrition to the parts, a lack of perfect functional activity in the cells.

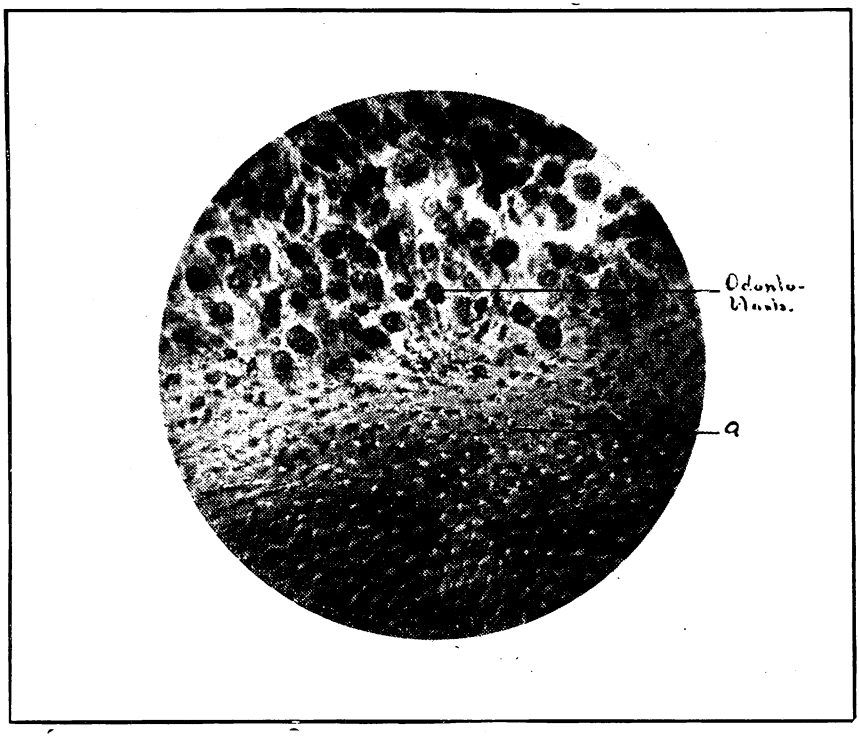


FIG. 33.—ODONTOBLASTS IN TRANSVERSE SECTION, X 200.

Exceptions might be taken to the statement that the racemose appearance of the early odontoblasts to which I have referred by claiming the section to be one not directly through the long areas of the cells, or perhaps transversely through them. I have been fortunate enough to secure a number of sections, one of which is shown in Fig. 33, in which the cells are cut transversely, this being proven from the fact that the forming dentine at (A) appears with the tubuli squarely cut off showing the

dentinal fibers confined or rather appearing as though projecting from the lumen of the tubes. It will also be noted that the odontoblasts are irregular in outline, some of them being almost hexagonal, and as the calcified tissue is approached, they become gradually reduced in size and much modified in contour.

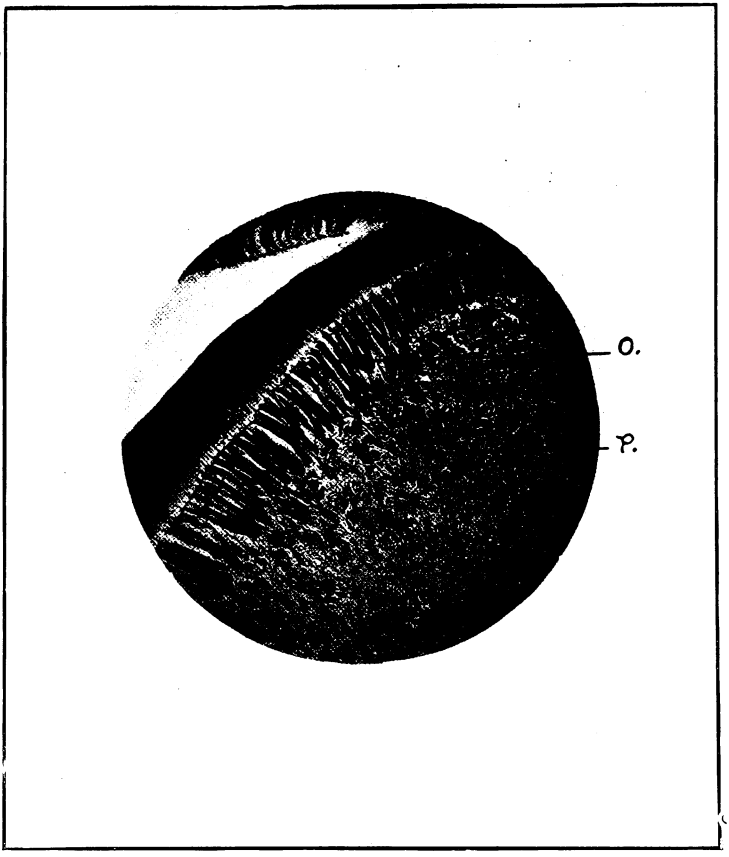


FIG. 34.—ODONTOBLASTS AND PULP CELLS. AFTER GYSI.

After a dentine cap or matrix of considerable thickness has made its appearance and the enamel cells are about to assume their functional activity, the odontoblasts for the first time begin to resolve themselves into the elongated flask-shaped cells, thus answering the description usually

accorded them, as illustrated in Fig. 34. In fact it would appear that they assume this shape only when the actual lime deposit begins. If we examine the line of union between the dentine and enamel during the early growth of these tissues, it will be ascertained that notwithstanding the dissimilarity of the two structures at maturity, there appears at this

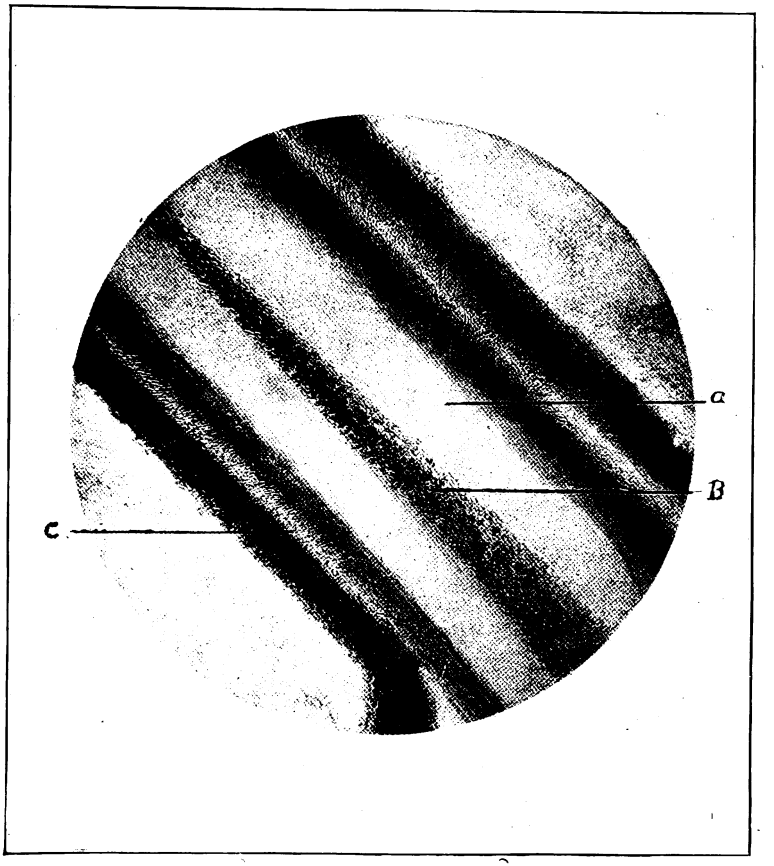


FIG. 35.

line of junction a matrix which may be differentiated only by the free extremities of the ameloblasts, as shown in Fig. 35. When the cells begin to form the enamel matrix a faint line of demarkation between the two may be observed, the difference in the appearance of the groundwork of

the two structures being one brought out by differential staining, that of the enamel taking the darkest stain.

During the advent of this common matrix, if it may so be styled, many prolongations from the odontoblasts penetrate the enamel matrix, and finally become encapsuled as fixed dentinal fibers extending into the calcified enamel. It is not uncommon in the minute study of the tooth tissue to find these communicating fibers in abundance, and the writer,

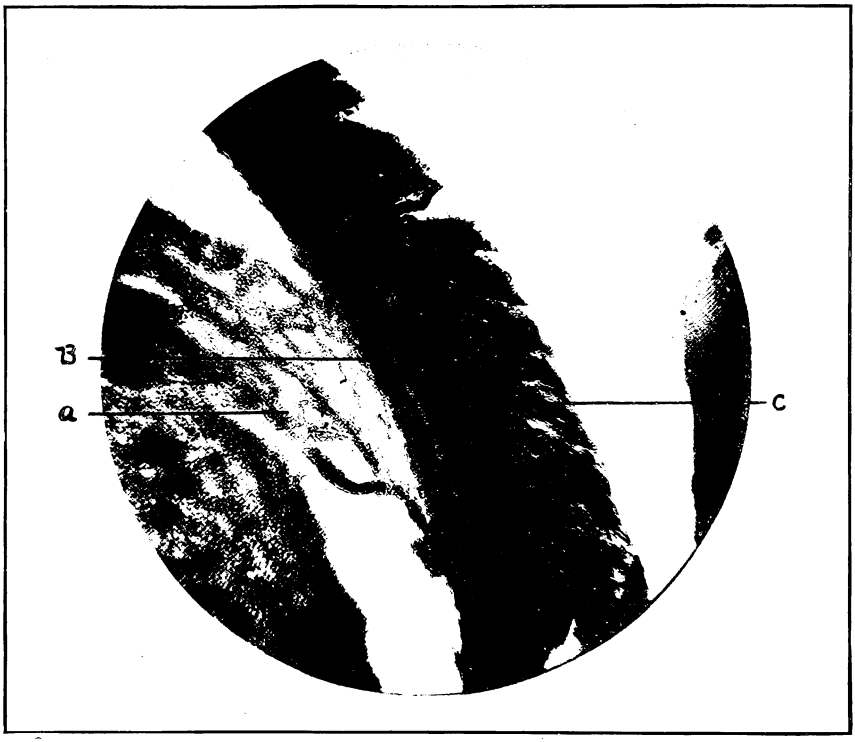


FIG. 36.

although at one time denying the possibility of such a condition, now desires to express the opinion that the prolongation of the terminal fibers from the dentinal tubuli into the enamel is not only a constant but an essential feature. As a result of this we have the deeper lying enamel or that contiguous to the dentine, provided with a greater amount of organic matter and imbued with sensibility far exceeding that of other parts of the tissue.

When we arrive at the consideration of the calcification of enamel we at once enter upon a field which has for years furnished wholesome food for thoughtful research, and many observers have exhausted their best endeavors to unravel the mysteries surrounding the process of enamel formation. Glancing over the various epochs, we note that the subject has had the careful consideration of such men as Todd and Bowman, Kolliker, Tomes, Waldeyer, Heintzman, Bodecker, Abbott, and more recently

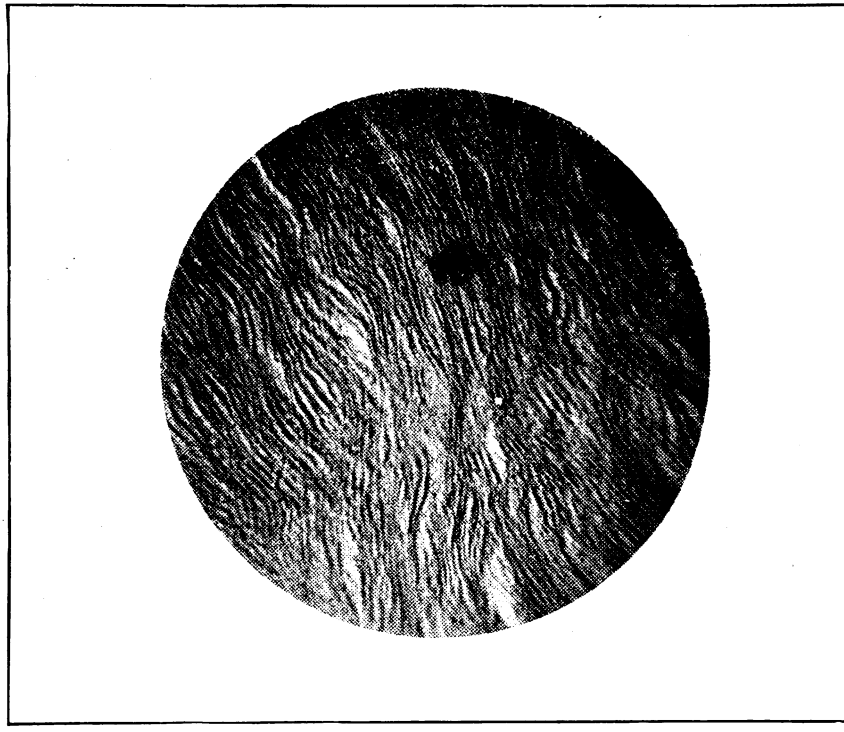


FIG. 37.

the admirable work of Williams. To attempt to compete with this galaxy of illustrious predecessors either by pen or illustration, would be beyond the scope of this article, but I feel that my subject may be brought to an appropriate termination by a brief summary of this phenomena.

Two theories have for many years obtained as to the manner in which enamel is calcified. In one it has been claimed that the active enamel forming cells, the ameloblasts, become directly calcified or converted into enamel; in the other these cells are simply recognized as controlling agents, secreting or depositing the enamel salts which form the enamel

prism. In the latter it is the accepted belief that enamel is secreted or shed out from the extremities of the ameloblasts, resulting in the production of enamel rods corresponding in size and position to the secreting cells. To my mind there is no better method by which to study the character or mode of development of a growing or matured tissue than by an artificial disassociation of its component parts.

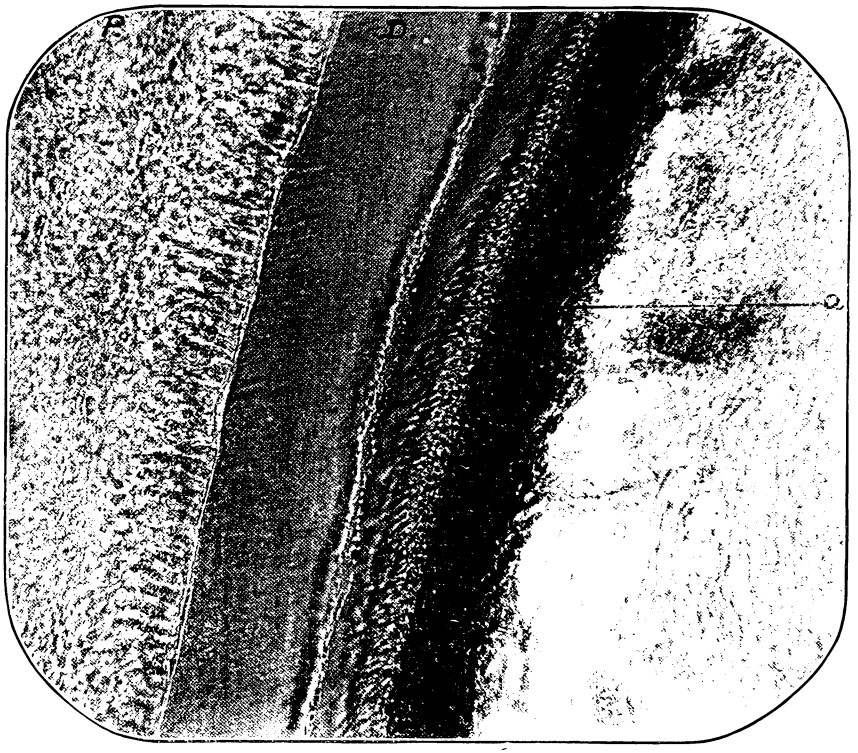


FIG. 38.—THE EARLY PROCESS OF ENAMEL CALCIFICATION, X 200.

Fig. 36 shows a section of newly formed enamel which has been acted upon by a weak solution of nitric acid, and it will be observed that the action of the decalcifying agent has produced a fiber-like appearance in the first formed enamel or that most distant from the formative cells at "A."

This desolation of the inorganic matter has left behind traces of the shaping of the primitive matrix, which action could only be brought about at the time, and by the manner of calcic generation. In the illustration

the remains of the stelate reticulum are shown at "A," while at "B" the ameloblasts are seen backed up by the cells of the stellate reticulum. Just what the nature of the tissue may be at "C" is somewhat a matter of conjecture, but from its general appearance and from what we know of the action of the nitric acid upon the tooth tissues, we must arrive at the conclusion that most all if not the entire amount of inorganic salts has been removed from the structure, and that what remains is but the organized matrix of the young tissue.

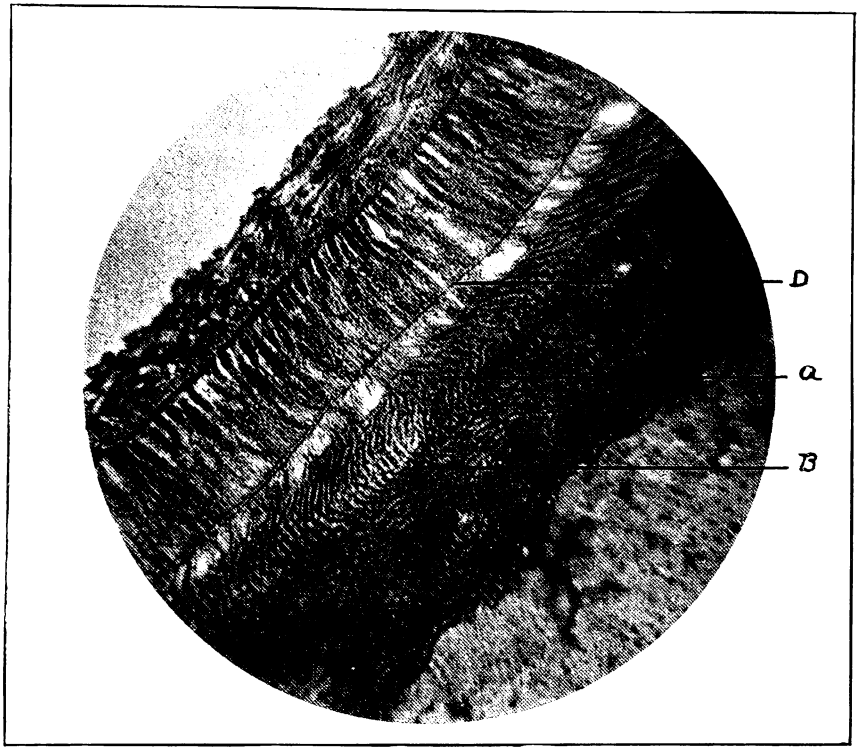


FIG. 39.—THE CALCIFICATION OF ENAMEL, X 200.

Fig. 37 is a portion of Fig. 36 under high power of the microscope, and in it we are given an opportunity to learn more of the general character of the tissue so far as its appearance is concerned. The fibrous nature of the structure as well as the relative distribution of the markings which, as I have already stated, are the inevitable results of cell activity, certainly does not favor the theory that the growth of enamel is by the direct calcification of its formative cells, but rather that it is the result of secretory action.

By the direct calcification of the ameloblasts we would naturally expect the process to begin on the exterior of the cells and gradually pass into its interior, the central portion being the last to calcify. This would result in an enamel prism corresponding in size and form to the generating cell, and in a measure this similarity between the calcified and uncalcified structure does exist and is one of the potent factors in the

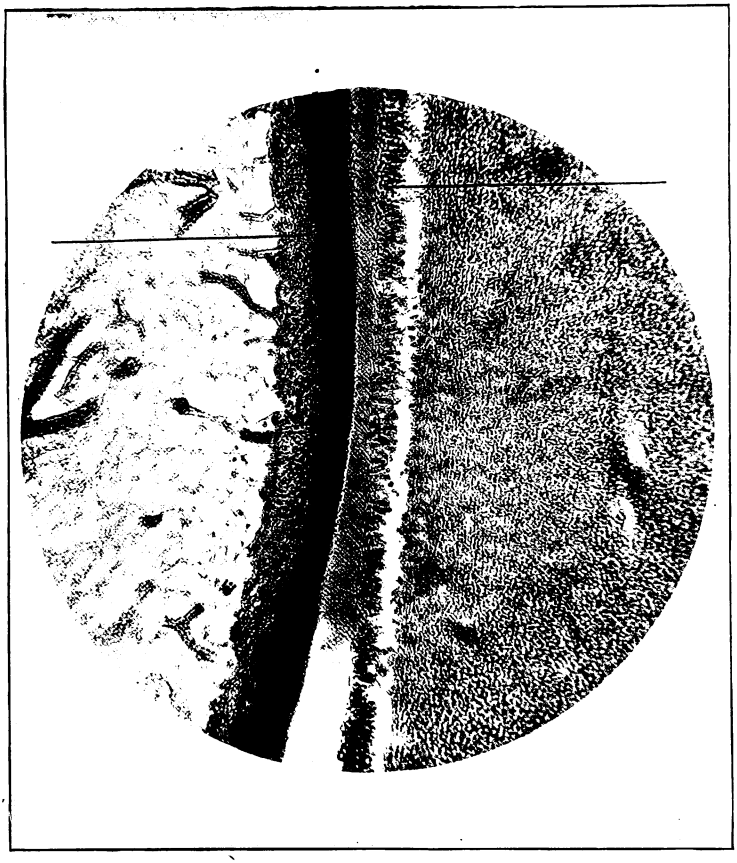


FIG. 40.—CAPILLARIES IN THE STELLATE RETICULUM.

recognition of this theory, but it is hardly sufficiently convincing to warrant a general acceptance of the belief.

When we examine Fig. 38 we are at once impressed with the importance of the secretory theory. Here we note that the early formed enamel at "A" record what appears to be the definite action of the ameloblasts by

prolongations of partly calcified tissue extending from the cells, these markings corresponding in number and location to the cells themselves. Between these prolongations and ameloblasts at "B" are many highly refractive granular bodies which I take to be the actual lime deposit shed out from the free extremities of the cells, from which they pass into the substance of the then organic matrix beyond at "A" and form the enamel prisms.

It matters but little in what part of the tissue or at what period of its growth, the examination be made to learn of the action of the decalcifying agent, it will never be found to take place in a manner corresponding to the direction of the enamel fibers, but decalcification takes place in the older enamel more in the form of a general breaking up as shown at "A" in Fig. 39, while at "B," which represents the newly formed tissue, the action is one which appears to indicate a breaking up of the interprismatic substance and favoring the theory of secretory amelification.

This illustration shows to good advantage the so-called structureless basement membrane, so long a subject of discussion as to its character and function. Williams classes it as newly formed enamel, and at the same time compares it to a similar zone at the distal end of the cells "D."

Just why this line of distinction between the enamel cells and their product should ever have been so misunderstood is somewhat a matter of surprise, as it possesses none of the characteristics (which means an absence of all characteristics) to properly classify it as structureless. I have but little doubt as to its character, and regard it as being without function, it is the primary product of the ameloblasts, while the corresponding zone at the distal end of the enamel forming cells results from the functional activity of the stratum intermedium.

Fig. 40 shows a section near the point of the cusp of a developing molar and exhibits a portion of the enamel organ at a time immediately prior to the beginning of enamel calcification. "A" is the uncalcified dentine, "B" the ameloblasts now closely associated and very regular layer of elongated cells, and behind these we observe another layer of cells which undoubtedly serve as feeders to the ameloblasts, the stratum intermedium. This section is particularly valuable in that it shows a number of capillaries distributed through the body of the stellate reticulum and actually penetrating the stratum intermedium as seen at "B."

When viewed with a low power these minute blood vessels appear to form a complete network, and in the districts between the cusps pervade the entire structure from the stratum intermedium on one side to the same cells on the other. The appearance of this animated vascular supply to the enamel organ is coincident with the process of calcification, for during the early life of the tooth germ it is non-vascular.

The Qualitative Factor in the Preliminary Dental Educational Requirement.

By EDWARD C. KIRK, D.D.S., Phila., Pa.

Read before the Central Dental Association of Northern New Jersey, November, 1899.

It may be safely asserted that no one thing so surely indicates the rate of advancement in dentistry as the demand of its votaries for higher standards of educational qualification. In all directions the thought finds emphatic expression that in order to fill out to its full dimensions the popular ideal, the dental practitioner much hereafter possess an educational equipment far in advance of that heretofore considered sufficient. Originating within the professional ranks, the cry for higher standards has awakened a sympathetic echo in public opinion, and it is evident that the demand must be adequately met.

When it is considered that our educational system had to be created; that but few if any precedents were available; that the curriculum was in the first place an uncertain quantity and ever afterward a constantly changing one; that it had to be weeded out and added to as the conditions of professional progress necessitated these changes, it will be readily seen why the thought of dental educators has been mostly concerned with the technical side of the problem, rather than with the character of the material to which this educational system was to be applied.

Gradually, however, the fact has obtruded itself, that in order to successfully pass through the details of the curriculum demanded in representative dental schools, a certain degree of preliminary education is essential in order that the dental student may absorb and profit by his professional instruction. Hence, the establishment of a standard of preliminary educational requirement and the progressive increase of that requirement toward the point where it logically belongs, namely, at the termination of the public high school course.

I am well aware that a standard of preliminary education equivalent to high school graduation has not as yet been made generally obligatory, but that it will in the near future attain that point I do not for a moment doubt.

It is not within the purpose of this paper to discuss at length the desirability of, or objections to, such a standard as representing the amount of educational attainment which should be required of every student entering upon the study of dentistry. To those who have carefully examined the problem with minds unprejudiced, the reasonableness and propriety of exacting the equivalent of a high school education as the foundation upon which to build the superstructure of professional training, must be self evident.

There is, however, a phase of the subject which it seems pertinent that we should investigate, viz., the nature of the training which furnishes the best basis for professional study in dentistry, and what kind of a high school course offers such a basis.

An inquiry into this matter is opportune at this time because the adoption of the high school standard is an accomplished fact in New York and New Jersey, and I am perhaps betraying no confidences when I say that Pennsylvania is incurably inoculated with the same idea. With the precedent so well established, other States will surely follow if only in self defense. The inquiry is pertinent also for the reason that a high school standard is by no means a uniform standard, and therefore not all high schools fit a student as he should be fitted for taking up professional study.

Preliminary Qualifications.

Those who have concerned themselves with the problem of educating students in dentistry have quickly realized the need for a proper foundation upon which to build; this need has been variously estimated or apprehended; but all observers have agreed that certain qualities natural or acquired, were necessary in the student who was later on to become a successful practitioner; successful in the sense that he possessed those qualities of mind and hand which enabled him to correctly function as an exponent of his craft.

Our literature contains unnumbered expressions of opinion as to the qualities and characteristics which ought to be possessed by the dental practitioner; they are as numerous and varied as the points of view of which they are the individual expression, and they have varied still further in accordance with the evolutionary development of our ideas as to what really constitutes dentistry itself.

We are probably in agreement that the dentist must possess manual skill, i. e., the power to put into practical execution the suggestions of the brain in practicing the art of our calling. This implies necessarily the ability to reason accurately and logically. But the broadening of our specialty has created the necessity for a much more extended use of ac-

curate reasoning and logical thinking than the mere art side of it ever did or can call forth.

The development of the field of dental and oral investigation in its relation to the study of the entire human system is rapidly placing dentistry in close analogy with the other departments of the great healing art and requiring at least an equal educational equipment of its practitioners. This educational equipment at its best, and it can only be so considered, demands a training which will develop the reasoning powers to the maximum limit, and make accurate observation and thinking the normal mental habit.

Is it the function of the dental school to furnish the training that will attain this much to be desired habit of mind? The very fact that we now demand a reasonably high standard of preliminary training furnishes the evidence of our belief that the dental curriculum is a special system of training which at the utmost can only be expected to solidify and round out the educational result of the preliminary course of instruction. We must look, then, to the public school course or its equivalent, to deliver to the dental colleges a product suitable for conversion into professional timber.

We have demanded a high preliminary standard and we are, generally speaking, attaining our desire. Having achieved that important point, let us now inquire as to the quality of the standard, for surely in demanding a given quantity of preliminary training, it is implied that it shall be adapted to our purposes.

A system of education to be of greatest use to the dental student must develop in him as nearly as possible those qualities which are to serve him best as a practitioner. This generalization is, I trust, broad enough to include those elements which are necessary to him as a well educated member of society apart from his technical professional training. For our present purposes we will agree that the high school course is sufficient to fit a man as an acceptable member of society. Our inquiry deals not with that question, but rather with the adaptability of the common school course as a training ground preliminary to the dental curriculum.

During three years of intimate connection with educational work in dentistry and a constant study of the educational problem in all its aspects throughout that period, two observations are presented as the outgrowth of that experience; first, that the gradual increase of preliminary requirement has not diminished the proportion of failures in course of the dental curriculum; second, that the students who as a class or group show the best general average of work are those whose preliminary education was obtained in the manual training schools. In asking you to consider the

significance of these two statements, I desire in the first place that you will carefully note that these observations are not offered as a criticism upon the high school standard as a measure of its quantity or degree of educational attainment, and second, that I am fully aware that the length of time is based, is inadequate, as is also the relative numbers of students under observation, as the basis for forming a definite conclusion regarding the value of the preliminary standard.

The observation, as stated, is therefore to be taken only as an indication of the lines upon which we may possibly suggest modifications of the standard which will best adapt it to our needs.

Perhaps no end of education is so important to the individual as its power to develop in him correct methods of reasoning and thinking. Any teacher who has experienced the difficulty of training students to intelligently reason about the problems which form the basis of his course of study will admit that the lack of that quality in the mind of the student is the most serious obstacle to his progress. To the student of dentistry the ability to think and reason correctly is a *sine qua non*, and unless the habit has been to a considerable degree established by his preliminary training, the dental course can only partially create it. This principle applies to technical manual skill as broadly as it does to abstract scientific study, for unless the student reasons with precision he cannot execute with precision.

How, then, is this essential mental characteristic to be secured for the dental student if, as will, I think, be admitted, the professional curriculum cannot wholly supply it? Manifestly, we must see to it that the preliminary training of the student has, as far as may be possible, developed the requisite qualifications for entering upon the dental course, and endeavor to shape the requirements of our high school standard with reference to that end.

True Meaning and Value of Manual Training.

I have referred to the value of the manual training course as a preliminary to dental study. Nine years ago I presented to the First District Dental Society of New York some observations upon the "Manual-Training Idea as a Factor in Dental Education," and I there endeavored to show the importance of that principle as a means of mental cultivation. Since that time not only has the manual training system become a regular factor in the dental curriculum, but as an educational means its value has been more generally recognized by the extensive introduction of that system into the common schools.

There has, however, been, I fear, a marked tendency in the practical application of the manual training method, to subordinate ends to means; that is to say, the great value of the system as a method of *mind*

training has been overlooked, and the cultivation of *manual skill* made the objective feature of the system. This is exactly the reverse of what the originators of the system intended, rendering its application not only wasteful of time and energy, but defeating its purpose as an educational method.

Let us take a specific case as illustrative of the two points of view under consideration:

An elementary exercise commonly required in the course of instruction in our manual training schools is that an iron casting roughly approximating a cube in form shall be dressed into shape by the student so that when finished it shall be a perfect cube as nearly as it may be possible to attain that result by the method employed. What is the educational purpose of such a requirement? Certainly not that the student may thereafter have the ability to make by hand cubes with mathematical precision of surface and angle, for if the thing produced were the objective feature of the process it would be, commercially speaking, more economical to produce cubes by special machinery, and the product would be not only cheaper but the output larger and on the whole better.

The objective feature of the exercise is then its educational value for the student who performs it. And, as I take it, the measure of its value is its efficiency as a means for compelling him to think and reason with precision and accuracy. Incidentally, he develops a certain degree of manual skill, which is the physical analogue of the mental result attained by the same means. In the repeated endeavor which he makes to attain perfection, as prescribed by the conditions of his work, his brain is constantly bombarded, as it were, by sense perceptions of the uncompromising demand for accuracy, correct proportion, perfection of plane and angle, without which all his labor inevitably goes for naught. The educational value of the operation is clearly its power to impress indelibly and concretely upon the student's brain the ideas alluded to. The repetition of these impressions with respect to the varied experiences of a similar character in his course of instruction become finally broadened into principles capable of the widest application. Later they become fixed as elements of character and are the motive power which determines his attitude toward all of the problems of life.

It is my belief that an objective system of training, one which constantly impresses the developing mind with the uncompromising accuracy with which nature in all her phenomena strikes the balance between cause and effect, and deductively, the inevitableness of her laws, is the kind of training most needed to fit a student for professional training in dentistry, to say nothing of its cultural value in any department of life. What a showing our profession would make if all of its members

were imbued with the qualities of accuracy and precision in thinking and reasoning as well as with an adequate conception of the proportions and magnitude of the relationship developed by the phenomena with which they are called upon to deal!

If we are in general agreement that these are qualities which it is desirable for us to have as dental practitioners then our inquiry should concern itself with the best methods for their attainment. It is perfectly evident that all high school courses are not adequately arranged for supplying this kind of mental qualification, nor would I wish to convey the impression that I regard the manual training school course as the ideal system for our needs. It is probable that a conservative blending of the best features of each system will more nearly meet our requirements.

I am strongly of the opinion that in addition to the manual training studies, mathematics, language, literature, history and especially science studies should be made an obligatory part of our dental high school curriculum, if I may so designate it. With respect to science teaching in the public school course, that wise counsellor in educational matters, President Eliot, of Harvard, has said: "A rational course in science, rational for the schools, because it affords a substantial training in observing, recording and reasoning, rational for the colleges because it affords sound preparation for further study of science during college life,—is a great desideratum."

With respect to manual training work, an eminent teacher in one of our manual training schools writes me: "We devote a little less than one-third of our time to manual work; nevertheless, we are very certain that our boys come to our culture work with a certain freshness of interest and an increased power of concentration developed by the manual training, which makes two periods of culture work with us count for almost as much as three periods in the ordinary high school course."

My object in presenting this subject for your consideration is to call your attention to what I believe to be the fact, namely, that a high preliminary standard is not all that the term *high* implies unless it is also adapted for fulfilling its purpose, which in this case is to determine the intellectual fitness of a student to enter upon dental professional study.

Further, while the termination of the high school course is the correct and logical point of departure at which to enter upon the dental course, not all high school courses furnish the best preparation for that purpose. Therefore in consideration of the foregoing, I submit as my concluding proposition that the importance of the matter demands that we take up the consideration of a plan of preliminary training for dental

study which shall best meet our requirements, and endeavor to have our high school courses modified to that end.

Finally, in view of the active interest of your society in educational matters, is it presumption on my part to suggest that it maintain its forward place in an educational way by making this question of the quality of the preliminary education the subject of its especial inquiry to the end that the influence of the State may be enlisted in creating a standard of qualification for entrance upon the study of dentistry, which will be adopted by the better class of schools throughout the country?

Address to the Louisiana State Dental Society.

By Dr. R. K. Luckie, Holly Springs, Miss.

(*Reprinted from Transactions of National Dental Association, Southern Branch.*)

Freed from the tiresome routine of the office and from the constant care and anxieties of business life, we come gladly, yea eagerly, to refresh ourselves once more in the loved assembly of friends and brothers.

As a member and representative of the Southern Branch of the National Dental Association, it has fallen to my lot and become my duty to acknowledge and make response to the graceful, kind, and cordial welcome that has fallen from the lips of the distinguished Mayor of New Orleans, and from the accomplished gentleman who represents the Louisiana State Dental Society, an organization which he both honors and adorns.

We feel and we know that they have reflected the feelings and sentiments held and cherished for ourselves by the brotherhood of our loved, our bright, and ever charming Southland.

Among the incidents and episodes of professional life a convention or convocation of dentists, inspired by a common impulse and animated by a common purpose, will always be not only refreshing and enjoyable, but refining and elevating, strengthening and ennobling; but with the circumstances that distinguish the present occasion, the splendid welcome accorded by Louisiana, by New Orleans, her great commercial emporium, and by our own special fraternity, we are well-nigh enchanted, though not surprised, for we already knew the South—we knew its magnanimity, its hospitality, its proud chivalry, and its unmatched and unmatchable kindness and courtesy.

Gentlemen of the Louisiana State Dental Society, our eyes are brightened, our hearts are warmed, our pulsebeats quickened, and our resolves to press on and up to the topmost plane of professional progress and advancement find aid and inspiration in our present surroundings and in this dignified and fraternal presence.

We wish that we could command words with which to give expression to our estimate and appreciation of the welcome we have received from a great city and a grand and noble people; a welcome not only to your hearts and hearthstones, but to scenes and associations of historic interest and of national magnitude and importance.

Our memories are quickened and our minds impressed by what we have already experienced, and by what we anticipate in the transactions we are now inaugurating; and you may feel assured that while enjoying your courtesy and kindness we will gladly share your efforts and labors in the promotion and advancement of a common interest and calling, and rejoice in the triumphs that may reward your fidelity and devotion to a beneficent and honorable profession.

Some of us have had a hard time getting here. It was hard to cut loose from business so long as there was a dollar in sight these close times; hard to feel that we could spare even a few days, notwithstanding it was for such a good cause; yet in the face of every difficulty we are here, and as the mind fondly lingers on the glad welcome which has just been extended to us in such glowing and eloquent words, we feel that already are we doubly paid for making any sacrifice to come to this meeting in this delightful place.

We have left our homes and our loved ones to bear to this assembly whatever of contribution Providence has placed at our disposal as a free-will offering upon the altar of professional faith and worship, feeling, yea knowing, that we shall receive and bear back a dividend upon our investment that will more than compensate our sacrifices, reward our labors, and leave us rich in new attainments, in increased and added resources, in fresh, sparkling gems and pearls of knowledge; rich in a new and bright illumination for our guidance along the pathway of future research and advancement, and rich in the esteem and approval of our co-workers and fellow-craftsmen.

Mr. President and members of the Louisiana State Dental Society, we want to say that the Southern Branch of the National Dental Association congratulates itself upon the selection of New Orleans as a place for our anniversary meeting. We can imagine no other city or town or locality that could so perfectly fill all the conditions and requirements of a successful, charming and most profitable reunion.

Here we strike your grand, majestic river, the matchless old Mis-

sissippi, flowing past you, ever onward to the sea, in its strength and glory; a river in itself a wonder, a marvel, and a revelation to many of us; an inland sea, bearing upon its bosom the treasure-laden argosies of every land and clime.

Here we find a city of two hundred and fifty thousand souls, resting quietly upon the great Gulf of Mexico.

We find centering here seven great trunk lines of railroads, representing forty thousand miles of steel rail.

We find that you have here three thousand manufacturing establishments, with an annual output of one hundred million dollars.

Here we find the largest cotton market in the world; the finest quarantine station in the world.

Here we find the stimuli and energy of a world-wide trade and commerce; we find a soft, balmy climate, and a wealth of fruits and flowers that would adorn and glorify a second Eden.

Here we find wealth, health, music and beauty, and, to cap and crown the distinguishing characteristics and environments of your "Crescent City," we find a proud array of gallant, chivalrous men, and a more imposing and resistless array of lovely women, peerless in their matchless grace and radiant beauty.

In this day of marvelous national development and expansion, in this hour of the dawn of a magnificent commercial enlargement, no one may overdraw the possibilities of this commercial gateway to the tropical seas, with the stupendous project of the canal from the Gulf to the Western ocean, opening up the ocean's highway for the world's commerce through beautiful Nicaragua, thereby bringing us in closer touch with the isles of the Philippines, and, farther to the west, with the countries of the Orient.

We say that no imagination can picture the value of this grand port and outlet to our Southern land and to our common country. It is peculiarly meet and fortunate that we may hold our annual assembly in a city noted for the culture and refinement of its inhabitants, for its educational and benevolent enterprises and institutions, its splendid university, and its grand charities.

Some of the most distinguished men America has yet given to the world—scholars, physicians, surgeons, ministers, jurists and statesmen—here have lived and caught their inspiration and achieved their renown in this famed and favored Southern city, and here we find our special department of general science not only fully recognized, but brilliantly illustrated in the practice of representative men "to the manor born," or sons by choice or adoption.

We do not regard it as invidious or unjust to others when we assert

that in no section of this or any other country can be found finer examples of scientific and artistic dentistry than are wrought by our brotherhood of New Orleans.

But apart and aside from the many other attractions and advantages presented by your charming city, there is another element of interest and gratification to be found in recalling some of your local traditions and historic incidents.

Here in the long ago the flags of old Spain and of France were unfurled by the adventurous pioneers, explorers and searchers for gold, for treasure, and for the fabled "Fountain of Youth."

Here was planted a colony that for long years acknowledged fealty and paid tribute to the monarchies and despotisms of foreign lands, as well as to the ungoverned and lawless freebooters that infested your river and neighboring waters. The colony grew, became an important military and naval station, and ultimately passing from the control and government of European powers, by purchase from France, its last foreign owner, was, with its vast territorial domain, erected into a State and became a member of the American Union.

With a wealth of soil and production rivaling the delta of the Nile, with its tropical and sub-tropical fruits and flowers, and its great staples, corn, cotton, sugar and molasses, Louisiana and its chief city soon became the focal center of a commerce that fixed its impress and aegis upon the political economy and social conditions of our civilization; and, while dominating the marts and markets of the earth, has to this day given commanding power and prestige to our common country in all its relations and connections, commercial, civil, social and political the world over.

That such a State and such a city should excite the envy and cupidity of hostile nations, or that their invading armies in time of war should be attracted by the hope and promise of capture and spoil, is not remarkable or surprising.

The Great Victory at Chalmette.

An incident in your history which for years startled and even bewildered the nations of the world was the battle of New Orleans, January 8, 1815, when the hitherto invincible hosts of Wellington's veteran soldiers, marching to the battle cry of "Booty and Beauty," went down before the prowess of Southern woodsmen as autumn leaves go down before an autumn storm.

Modern history records no grander example of true courage than was illustrated upon the field of Chalmette. Modern history records no grander victory than was gained by Jackson upon the field of Chalmette. And why such a victory? Because the Tennesseeans, Kentuckians, Mis-

sissippians, Louisianians, and all who had the honor of fighting for America's cause on that memorable day remembered the command of their gallant leader, "Stand to your guns; don't waste your ammunition; see that every shot tells."

The American soldiers did stand to their guns on that victorious day, and their marksmanship received the commendation of the great Napoleon. When all was over, when the last shot had been fired, and the scurrying smoke had left the bloody field, it was found that two thousand six hundred of those fine, brave, smoothly-shaven soldiers of the King of Great Britain, our cousins in blood and tradition, had kissed the earth, and with them fell the gallant Packenham, Gibbs, Keane, the brave Major Wilkerson, whose dying words were, "Tell my commander that I fell upon your parapet," and many other British officers; while on the American side only eight men were killed and thirteen wounded.

One of the happiest and most exciting days in the history of your lovely city was when the young Creole came dashing in from the field of Chalmette, crying aloud, "Victory! Victory!" announcing that Packenham had been defeated, and that your lovely city was saved from British possession and British pillage.

While these reminiscences and memories bear no special relation to the present occasion or its objects and purposes, they yet lend zest and interest, and we trust some inspiration in and for the work before us; and, moreover, the name and fame of Andrew Jackson and his heroic riflemen, who, against such fearful odds, such overwhelming numbers, saved your beautiful city from loot and pillage, should ever be held in fond remembrance and be kept fresh and green by the sons and daughters of the South. There never was a time in the history of this government when the American soldier failed to distinguish himself upon the field of battle.

This is a great country, a great nation. When it was decided that we should come into hostile array with the arrogant and boastful Spaniard, with the proud representatives of the land of the Alhambra, of Ferdinand and Isabella, what was the result?

Almost in the twinkling of an eye we had appropriated fifty millions of dollars for the necessary war preparations. Almost in the twinkling of an eye we had organized and equipped an army of two hundred and fifty thousand brave men, who came from every section of our country, from every State of our Union, from all the vocations of life; men of all classes and conditions, the cultured and the uncultured, the rich and the poor, offered their money and their lives for our country's cause.

Our navy was strengthened. American first-class battleships, protected and armored cruisers, monitors, gunboats and transport vessels were covering the seas in two hemispheres. And while there was some

reason why this mad rush to arms should not have been made, still the unanimity with which our people acted was amazing and gratifying in the highest degree.

Party and sectional lines were well-nigh obliterated, and today the American people are in a closer bond of patriotic union than they have ever been before. We have forgotten almost everything of the past except our national glory, and it has come to be seen that much of the old misunderstanding and the prejudice and the old bitterness have disappeared, and that we now love and honor alike the one national flag; and may it float proudly and peacefully not only over these United States, but over our newly conquered islands of the sea.

In the short space of three months battles were fought on either side of the globe, and great voctories won. The masterly stroke in Manila Bay, the determined action of our men at El Caney and San Juan Hill, which was either to die or to conquer, and the complete destruction of the Spanish fleet around the mouth of Santiago's harbor, are only characteristic of what American seamen and soldiers can do.

All honor to America's navy, which now ranks alongside of the great navies of the world, and which will henceforth act as a potent factor in affairs of the sea the world around!

All honor to America's regular and volunteer forces! All honor to American energy, skill, adaptability, and confidence, which is sufficient to overcome all difficulties!

All honor to President McKinley and his wise counsellors! All honor to the loyalty and patriotism of Lee and Wheeler, the daring deed of Hobson, and the blood of our dead heroes!

The war with Spain, the proud old monarchy, redolent with the memories of a glorious and chivalrous past, has acted as a thunderstorm to our civilization, clearing the atmosphere and giving our War and Navy Department and our representative men a keener insight into our national and international affairs; thereby our Government has been placed upon a higher, broader, and a safer plane than ever before, and we have been indelibly stamped as a hero nation among the great powers of the world.

Dental Progress.

In this great country, amidst war and pestilence, the dental profession moves steadily on, never halting, never hesitating. Our progress in all the departments is well marked and encouraging.

Only a few years ago we were hardly known as a profession; today we are not only fully recognized, but it is believed by many that there is no profession that is more important or doing more good than the one we represent here today.

We feel, Mr. President and fellow members, that we hazard little in assuming and asserting that in no part of the civilized world has the science and art of dentistry (or, if you prefer, stomatology), been more earnestly and sedulously cultivated or more skilfully or successfully practiced than in our own age and country; and it is neither arrogance, egotism, nor vainglory to claim that the dentists of the South are holding up their end of the line, touching elbows and marching abreast with their brotherhood in not only every other section of our country, but with the foremost of all the lands abroad.

This assembly of representative men from Louisiana and every other Southern State evidences our interest and our loyalty to an honorable and beneficent calling.

Surely it must be a pleasant thought for those who have borne the brunt and burden of the day, who have labored with heart and hand for the good of our loved and honored profession, to look backward and feel that their labors have been rewarded; to look forward and realize that the open sky is upon us; the perfect dawn of our day of prosperity foretells the brightness of our future as a profession.

Let us be true to ourselves and loyal to our profession; loyal to a profession which today is an honor to our civilization and a blessing to humanity.

We feel, Mr. President, that we voice the sentiments of at least the members of the Southern Branch of the National when we say we will be loyal to our profession; and we will be found to the last holding aloft its banner that is so sacredly enshrined in every one of our hearts.

Mr. President, and members of the Louisiana State Dental Society, allow us, in conclusion, to again thank you for your grand reception and for your cordial welcome, and to invoke upon this anniversary meeting the largest possible measure of success and profit to us all; and for yourselves especially a continuance of that prosperity and good fortune that has distinguished your past, and that forecasts and presages a future even more bright and beautiful, more grand and imposing.

The Central Dental Association of Northern New Jersey.

November Meeting.

A meeting of the Central Dental Association of Northern New Jersey was held at Davis's Parlors, Newark, N. J., on Monday, November 20, 1899.

In the absence of the president, Vice-President H. S. Sutphen called the meeting to order.

Dr. Sanger's motion to dispense with the regular order of business and proceed to the reading of the essay was put and carried.

Edward C. Kirk, D. D. S., of Philadelphia, Dean of the University of Pennsylvania, then read a paper entitled:

"The Qualitative Factor in the Preliminary Dental Educational Requirement."

Discussion.

Dr. S. G. Perry, New York.

The Reverend Edward Everett Hale many years ago wrote a little story entitled "My Double and How He Did It." In his many duties his time was very much taken up, and he found it necessary to have some one to send to meetings as his representative. He secured a man who resembled him so closely that he could be used for that purpose. Dr. Hale furnished his substitute with a formula to use on certain occasions; at this place a few sentences, and at another place other sentences, but the prevailing one, when he was called upon to speak, was to say: "The last speaker has so fully represented my views on the subject that there is nothing more for me to say." As a matter of fact it really is so in this case. Dr. Kirk does everything he does so well that really there is nothing left to be done or said. If I may be personal in alluding to him I will say that there is a certain quality of common sense in his intellectual makeup, which makes it a foregone conclusion——

Dr. Kirk. Mr. President, I shall have to call the gentleman to order; he is getting personal.

The Chairman. He is quite in order!

Dr. Perry. ——that when he makes a statement it will be sure to commend itself to the best conservative judgment of those who listen. It seems to me there can be no exception taken to the paper in its completeness. There is not any proposition that is so certain as that the preliminary education for a dental student is of the first importance; not only that he shall become a competent professional man, but that first of all he shall become an educated man. In any community an educated man will have more influence than an uneducated man, and it is of the first importance for a young man entering a profession to be an educated man, and educated in a broad way, in the fundamental branches that are taught in the public schools, and I think Dr. Kirk does well when he alludes to the public schools as his basis, because they present the best form of education that is known, and it seems to me the proposition of more perfect fundamental education is certain to obtain. We may talk about it as we will; it is certain to come whether we help it or not, and if we help it in such ways as we can it may come sooner, but I have lived long enough, and seen changes enough in the profession to feel perfectly certain that higher education is inevitable; it is part of the higher civilization which is found in this country to-day, and young men intending to enter the profession may make up their minds that they must make themselves competent before doing so.

The example which has been set by the States of New York and New Jersey will one day be found to be universal throughout this country; there can be no escape from it. The education necessary to fit a man for dental practice today should be of the broadest kind, because the dental profession makes very large claims upon any one entering it. It may seem a little boastful perhaps to make the claim that it is one of the greatest and grandest and loveliest professions on the face of the earth, but really it is so, and it calls for a very great diversity of knowledge. To be a dentist and to be a good one, one must first be a man; and to be a man he must be educated in the sense in which education stands today. He must have knowledge in many different directions, not accurate knowledge in all, but fundamental knowledge; he must have a good start if he is to be a success, and while it may be a little discouraging in a certain way to see so many colleges being formed throughout the country and so many students turned out, because it seems impossible to have them all well educated, yet if the standard of today is compared with that of twenty years ago, we readily see what a great advance has been made, and the students coming into the profession today cannot be compared

with those who entered it when I was a young man. The young men coming in to-day cannot realize what a change has occurred and what facilities exist for education now throughout the country. The South has its educational institutions, and the West, also; so too has the East, New York perhaps fewer than any. Why that is I do not know. However, that is aside from the question. It seems to me that the ideas which have been put forth by Dr. Kirk are sure to prevail, and there will be more attention hereafter directed to the preliminary education, the final and technical education following as a matter of course. (Applause).

Dr. O. E. Hill, Brooklyn. It gives me a great deal of pleasure, more perhaps than any of you can conceive, to see the Dean of a college get up squarely and fairly and endorse what New York has been fighting for, for twenty years. Is it not the only professor, the only dean, in the United States who has done that thing? Does not every other one quibble? The Dean of one of the colleges had the impudence to say to me this summer that New York today was doing more injury to dental education than we could conceive, simply because we demand a high school education, and to have a professor get up and plant himself on the platform that Dr. Kirk has is to me a very great delight. Those of you who have not read the paper of Dr. Darby, of Boston, followed by Dr. Kirk, and then by other gentlemen of Boston, should do so. It is found in the *International Journal.* It is the first square discussion of the subject that I have ever read. I for one am very proud of what Dr. Kirk has given us this evening, and the whole State of New York is proud of it, and I assure you, gentlemen, that we will assist you all we can; we will put warm bricks around you, just as warm as possible, and we want you to stand by us, and we want the professor from Philadelphia to come right in with us and bring his whole State, and when we get in that position we will be strong. Just think of it for a moment: The State of New York fifteen or more years ago was thrown out of the National Association because it demanded certain points of education and gave a degree, and they would not receive it. We did that to start this very educational principle. It was not for the young men; it was for those men who were older, who could have a degree. Twenty odd years ago D. D. S. was hardly known of among us, and some of us in the city of New York and in Brooklyn received invitations to go to Philadelphia and receive the D. D. S. simply because they wanted it to become known. That is so, is it not, Dr. Kirk?

Dr. Kirk. I suppose so, if you say so; I do not remember.

Dr. Hill. I do not know but that there are others in this room who have the degree. I am not finding any fault with it; it was perfectly legitimate; a young man

came into a city with D. D. S. attached to his name, and no one knew what it meant, so it was given to about twenty-five or thirty in New York and Brooklyn, and that is what first gave a start to D. D. S. in this country. Some fault has been found with the State of New York because we have gone a little fast. We have not; we have gone very slow, and the fault has been with the rest of you who did not follow us along; we have been gradual.

Let me say this as a matter of history. Two years ago, after a slight correspondence, Dr. Kirk came on from Philadelphia to see me, and broached the matter of interchange of certificates for examination. We found that under our law we could not do it, but immediately we procured an amendment which enabled us to. I only make the statement to show how quickly we grasped the thing when we knew of it, and I give Dr. Kirk the credit of suggesting it to us.

Are there not other States which are equally as high in their preliminary examinational requirements?

Dr. Kirk. I do not feel competent to answer that question; California I believe is, although I am not sure.

Dr. Hill. It has been suggested to me that there are two or three States which with very little change in their laws could come in under this interchange of certificates, and that is a very important step in the unification of laws concerning which Dr. Kirk read a paper last year.

Is not the University of Pennsylvania the only college in this country that has this preliminary educational standard and publishes it?

Dr. Kirk. Oh, no.

Dr. Hill. I mean to be equal to the High School course.

Dr. Kirk. No; the University of California does, and Minnesota. I think there are a number of them.

Dr. R. H. M. Dawbarn, New York. I do not speak, Mr. President, with any idea that I can help to enlighten the gentlemen present. My own work as a teacher has been for a great many years exclusively in connection with post-graduate teaching, rather than the preliminary training of students. Speaking for the profession as a whole, it has been a matter of the utmost gratification to see how state after state has come into line in that direction. The State of New York, the State of New Jersey and the State of Pennsylvania, without any doubt today have as high educational qualifications as any

for a general medical certificate; I have not so closely observed with regard to the dental certificate, I regret to say, but it has been my duty to prepare graduates for medical examination, and so I know in that way. It is almost inconceivable that old Massachusetts, the State which contains the hub of the universe, has for its examination purely practical matters; a man does not have to pass in anatomy, physiology or chemistry, and in nothing but the practical branches. Some of the wildest and wooliest states of the Union have a stiffer examination today than Massachusetts has. The old practitioners have been doing their best in that line, but, unless within the last year, they have not succeeded in getting the kind of an examination that New York and New Jersey have. As a matter of fact, and I do not say it because I happen to be in the State of New Jersey, I think the New Jersey examination is the stiffest of all, and for that you have reason to be proud. It is a matter of pity that the states do not unite on some common basis of examination, so that a man who has passed the hardest of all State boards, say the New Jersey or New York board, which pluck perhaps 30 per cent of the applicants, should be able to practice anywhere. We ought to get together and have it understood that there should be a definite qualification. As far as the State Medical Board is concerned, a man must have the equivalent of a high school examination, or pass that examination.

I do not think any one could differ at all from the attitude taken by Dr. Kirk, who is most wise and most sound, and I do not think there could well be a difference of opinion on that subject.

A Hornet Story.

At the dinner I looked over at the curiosity on the wall (referring to the hornet on the banner of the association), and I asked my next-door neighbor what that represented, and he asked me to guess; after thinking real hard I guessed it represented a rather robust and healthy Jersey mosquito, without a bill— for this occasion only. But it seems I was away off, and he told me a story of the late Dr. Abbott, and the history of the insignia of this society, and thereupon I took it for granted that the paper of the evening would be something that would mean possibly a buzzing and perhaps have a sting at the end, and perhaps some one who follows me will take the opposite side, just for the sake of having a little discussion.

I wonder if any of you gentlemen would be interested in a little piece of medical history apropos of your emblem. As my dear old grandfather used to say, who was a splendid story teller, after all the others had finished their stories, "This story of mine is a fact," the inference being that all the others had been whoppers! This story of mine is one of the late

Dr. Finn's, and it dates from the early days of Tennessee. He told of a former classmate of his who was trying to practice medicine in a little village there; for nearly four months his shingle had hung out and not a single patient had appeared. His money was getting down to the very lowest ebb, and he was very much depressed, when one evening he heard the "rattlety, rattlety, bang" of a man riding up to his door at great speed, and he believed that a patient had actually come at last. In his eagerness he forgot his professional dignity, and rushed to the door and invited the man in with true Southern hospitality. His visitor proved to be a robust farmer with a big swelling over the right eye, which showed a strong line of demarcation vividly red and angry, the redness running up into the hair. The visitor asked what the trouble was, and the doctor replied, "I am very sorry, my friend, but unfortunately it is a very bad case of erysipelas," whereupon the farmer jumped up, seized his hat, and turning to the door, remarked, "Ery-hell; that's a hornet!" (Laughter and applause.)

Dr. Wm. Jarvie, Brooklyn.

Mr. President, I have listened with a great deal of pleasure and interest to this paper. The propositions in it are so simply and tersely stated that it seems impossible that they should not be understood by everybody, yet strange to say none of those who have spoken have yet touched the subject.

As I understand the paper, it accepts, in fact, it states as a final proposition, that a high school education as a preliminary requirement is a settled thing for New York and New Jersey, and very nearly for Pennsylvania. The question that Dr. Kirk places before us is: "What shall that high school education consist of?" or as he puts it, "What is the qualitative factor in the preliminary education," for as he has said, a high school education may mean one thing in Pennsylvania and another in New Jersey and New York. The graduates from any one of these high schools may be well educated young men with a pretty good knowledge of things in general, but have they been taught those branches which shall best fit them to become dentists? And he has quoted President Elliott, of Harvard, as saying that a young man who has studied science in this high school course is better fitted to become a success in almost any work of life in which science shall be a factor at all. We can all readily see the great advantage a youth who has had any manual training would possess among dental students. Not that Dr. Kirk would make manual training the end, for he has said that in their training school the manual course occupies but one-third of the time, the other two-thirds being devoted to studies, but the manual training which they receive in that one-third of the time really fitted them to learn in the other two-thirds much

more than without that manual training they could get in the entire time, proving most conclusively the great advantage of this manual training. That is the question before us to-night, and what Dr. Kirk puts to us, and it is a question that requires a great deal of careful thought, and is a very pertinent question for this body, as one of the representatives of the three States that have been enumerated to take up and discuss, and discuss to a finish, what we really could recommend to the Superintendent of Public Education in Pennsylvania, New Jersey and New York as a course of study that would best fit a young man to enter a dental college. (Applause.)

This subject has been under consideration by the Regents of the University of the City of New York, our Board of Dental Examiners has discussed this subject with their representatives, getting up a special course of study in the high school that would best fit a young man to enter a dental college. No conclusion has been reached; there has been nothing but an introduction of the subject, but I assure you that the Board of Dental Examiners in New York State will be very glad to hear suggestions from this body, and I do not think it would be a very bad plan if this body were to appoint or suggest a commission representing the three States that would take up this question and report at the same time upon just this subject, and I assure you that the Board of Regents of New York State would very gladly receive and consider any suggestions that might emanate from such a body; they would be received with great consideration. I do not say that they would be adopted, because I can see difficulties that would need to be overcome before a special course could be arranged to fit students to enter dental colleges, because the number of such students is few in comparison with the total number of students in the high schools of the State. But I can also see that such a course would not only benefit students about to enter dental colleges, but would be a great benefit to students about to enter any scientific school—the Columbia School of Mines, Stevens Institute, and other such schools that might be mentioned, and I think it would be infinitely better than what we term the ordinary high school education.

I can see a very valuable outcome from this paper if it is followed up. (Applause.)

Dr. L. A. Faught, Philadelphia.

Mr. President and Gentlemen: It is with a great deal of pleasure that I have listened to the very able paper of Professor Kirk. The wording of the title of the paper and the subject matter presented are most opportune. To the close student of the history of dental instruction in the United States, it is apparent that we are entering today upon a new era—that in which a sharp distinction will be drawn between the

general development of the understanding, and the special training necessary for the following of a special pursuit. A third stage in our career has been reached. It is not a new creation—not even a new beginning—but an evolution from what has preceded it.

Briefly stated, the stages are these: A chaotic period reaching from the inception of the profession up to about 1890 of heterogeneous and indefinite educational entrance requirements. Then for nearly a decade, up to 1899, a second period, marked by the struggle to establish a homogeneous and, as progress was made, a high and definite qualitative educational entrance requirement. The third stage—that of today—the working out of the qualitative factor. You will recall the decided awakening of the profession manifested in the heated discussions along about 1888, etc., caused by the establishment of the English Exclusion Act—a recognition that "improved graduates would make not only improved practitioners, but improved instructors and improved authors." Speaking of the then developing advance—the engraftment of an educational entrance requirement, the editor of the *Cosmos* (Dr. J. W. White) wrote: "It is not, therefore, a mere increase in the number of more liberally educated dentists which is to be the outcome of the change noted, but an elevation of the general tone of the profession, and a consequent and deserved advance in the estimation of the community." The National Association of Dental Examiners crystallized this thought and feeling of the profession at that time by this memorial, which the secretary was directed to transmit to the National Association of Dental Faculties.

"The National Association of Dental Examiners would respectfully memorialize the National Association of Dental Faculties to authorize two advances in the system of dental education.

These are: First, that your association require the universal enforcement of a higher grade of preliminary education of candidates for matriculation. This proposition lies at the foundation of dental education, in which is involved the quality of the graduates of the future, upon which depends the advancement, the standing and the dignity of the dental profession," etc.

With this presentation in 1892 was inaugurated seven stormy years in professional development, during which time the mind of the profession has been concerned chiefly with a qualitative standard, which standard has been subject to many fluctuations, rising and falling alternately as pressure was brought to bear by the teachers, by the examiners, or by the profession at large, but out of it all has come definition, until, notwithstanding the slight lowering of the standard, made August 1, 1899, which may be regarded as but the passing fluctuation in a pulse, the true measure of which is known and established, it is safely assured that so far as

quality is concerned, graduation from a high school is the established minimum educational requirement of the very near future. The seed has been sown and matured, and while a few of the stronger colleges may delay the engraftment of this requirement for a period to allow the weaker ones to adapt themselves to an altered condition, the end is inevitable, and should not now give any one very great concern.

In the decade taken to reach this satisfactory result, the increased percentage in the number of dental students is 284 per cent. The establishment of a definite high dental educational requirement which is the equal of the entrance requirement to the study of any liberal profession, has not limited the number of those seeking the dental profession. Educators and the profession therefore may now quite properly consider the qualitative factor to the end that those entering the profession may not only be educated gentlemen, but especially fitted for the acquirement and practice of dentistry. The germ of this work in this era is, as the essayist of the evening has said, "in order to be of the highest utility, the course of study preliminary to dental training should be so shaped as to support the professional course, and render the mind of the student adaptable to the requirements of the dental curriculum." I most heartily agree with him that this is the logical conclusion, and I have been much interested in the suggestion which he has made to this end.

Let us, therefore, one and all, holding fast to the attainment reached in a qualitative factor in entrance requirements—high school education—bend now our best efforts in hearty unison to the engraftment in that curriculum of the qualitative factor. (Applause.)

Dr. R. Ottolengui, New York.

Mr. President: I was a little bit disturbed when our medical friend mistook the insignia of this society for a mosquito, because I happen to know that the design was taken bodily out of the Encyclopaedia Britannica, and, consequently it ought to be correct, but when the gentleman subsequently stated how his grandfather mistook the bite of a hornet for erysipelas, I found it easy to excuse him, as his knowledge of hornets is undoubtedly hereditary. (Laughter.)

Now as to the paper, I think I shall commit no breach of confidence if I repeat some things which were told me in Niagara. In a conversation with Dr. Cryer, he told me that he went to college with Dr. Kirk, and one day one said to the other: "How nice it would be if some day we could get on the platform and lecture to the students." One of those gentlemen is now a professor of surgery and the other is the Dean of the most important dental school in the country, which shows that both of these gentlemen had the ambition to gain high things and the will power to attain their ambition. Now is it possible for these gentlemen to have

a still higher aim and to attain it? I think the paper to-night is an evidence of such a possibility, and if you will bear with me for one minute I will endeavor to point that out.

The first healthy sign that America was to produce a learned profession was when dentistry was refused admission into medical science, and thereafter started a school system of its own. After a time, however, it was discovered that all of the colleges were not being unselfishly managed, and that the aim of some was financial rather than scientific preferment, the preferment being for the teachers rather than for the students. The result was, as Dr. Hill has told us, that New York, feeling, I suppose, that being the most important State it was necessary to be, as it were, a mentor to all the other States, took the bull by the horns and began to examine the products of the colleges. That has been imitated by the other States throughout the Union, until today we have examining boards everywhere—with many accompanying evils! The examining boards, however, have undoubtedly done good in bringing the colleges to a sense of their importance and of their true usefulness, and it is very gratifying, as Dr. Hill has said, to hear a Dean and the Dean of such an institution as the University of Pennsylvania, pronounce for higher preliminary education, which certainly must mean a higher education itself. Now, unfortunately, just as colleges were first good and then deteriorated, it seems almost as if we are approaching an era where, as the colleges are improving, the examining boards are deteriorating. We are familiar with the charges which have been preferred against the board in Illinois, but those present may not be familiar with the accusations which have been made against the board in California. The press of that State has been crowded, recently, with demands upon the Governor for the reorganization of that board, for the reason that it has been openly charged that members of the board demand from $250 to $1,000 for a license. Thus we see the possibility of corruption creeping into the dental licensing board when it is purely political in its aspect. I have information from that State which tells me that the board there is in no sense nominated by the State Society, but is a basket of political plums. The man who has been accused of these irregularities was appointed on the very first board which ever came into existence in California as a reward for political work in his own district, and although his removal from the board has been demanded by other members of the board, who are honest, his political prestige is such that the Governor denies his power to remove him. So we see, as I have said, that as the colleges are coming up, so in various sections of the country the examining boards seem to be going down.

The aim which I would suggest to the professors in the University of Pennsylvania is to so elevate the product of their schools that New York

State will be willing to have an amendment passed to its law saying that any one holding a diploma from their college could practice in New York without examination. And I am sure that New York would be willing to do that when the product is trustworthy, absolutely, as those gentlemen undoubtedly can make it. That would be the beginning of the end. It would make other schools come up to the standard set by that University, and it will gradually make examining boards unnecessary. I hold that examining boards are like the missing link of the Darwinian theory, which we are told cannot be found existent, because it was a transitory form necessary for the evolution of the ape into the man, and the man having been produced, the ape passed away. I hope that it may not be many years before the movement initiated by Dr. Kirk, avowing the necessity of a high preliminary education, will make examining boards known only as the missing link between the past and the future scientific and educational progress of dentistry. (Applause.)

Dr. W. W. Walker, New York.

Mr. President: I did not come here this evening expecting to discuss Dr. Kirk's paper, but in what little I have to say I will endeavor to keep nearer the subject than those who have preceded me. (Laughter.)

Dr. Hill spoke of the old gentlemen who went over to Philadelphia to receive the D. D. S., but he wasn't eligible at that time; he was one of the boys, and was just about the age to receive the M. D. S. of New York!

The dental clause that Dr. Kirk speaks of is a very simple matter to look after in New York City and Brooklyn, provided the Board of Examiners of the State and the office of the professors of dental colleges could be united in some way. (Laughter.) It would be very easy for some people to go to the educational department of our city and say: "In your grammar or primary department of the public schools, put a dental clause which would cover this and take it also to the high school," but until that little business between the examiners and the professors is all settled and thus become united, it would be almost impossible to include that clause. I know I have a friend who could look after the New York contingent, but since Dr. Hill's friend in Brooklyn, Mr. Jacobs, died, he has lost his pull; but I will put him onto a man over there who will help him. (Laughter and applause.)

Dr. C. S. Stockton, Newark.

Mr. President: I do not think I have much to say in regard to this subject, but I recollect a good many years ago I was at a theatre in Philadelphia, and Mr. Forrest impersonated Jack Cade, who you will remember usurped the functions of government, and when he was

asked "By what right are you here?" he replied, "By the right of a man." I was reminded of this incident by Dr. Perry's statement that to be a man meant a great deal. That is what Forrest put into that play. To be a man meant something then, and so it does today, and if we can make the preliminary education such as will make our boys men, as men should be, dentistry will be what it should be. Unfortunately in the past that has not been the case; many have entered the profession who should never have come into it; many are in it today who are advertising and scattering broadcast over the streets of Newark "sets of teeth for three dollars; warranted for twenty years." If they had been men, and taught what manhood meant, they would never have done such a thing. They lower dentistry when they advertise over the whole side of their building "Such and such a man, dentist." They are not dentists. As Dr. Perry very truly said, there is scarcely any profession that requires so many qualifications as dentistry. There are so many things come into it; if you take up manhood, if you take up mechanics, if you take up morality, if you take up everything almost that comes into the life of a man, you will find it belongs to dentistry. Sometimes I think we are degenerating and going back, although I said the other night that dentistry had kept pace with this wonderful age. I wonder if that is true. This is a wonderful age. What a wonderful thing to live in such an age as this when everything is being done in such a grand and magnificent way as it is today! Sometimes I become discouraged almost over the labors and outputs of a life spent in this age, and I wonder what the future will be. Sometimes I feel almost ready to give up, tired of life, and think that life's end has been accomplished, that life is scarcely worth the living. When we come to think about all these wonderful things which we are enjoying today, things that have come to us in the lifetime of men living today, we say "Perhaps life is not worth the living—what will the future be?" And is it true that dentistry has kept pace with the progress of the age? That is saying a great deal when you think what the progress of this age has been, and I am delighted to know that Dr. Kirk takes the position that we must have an education that is worthy of this progress.

But I doubt very much the suggestion of Dr. Jarvie, of Brooklyn, and of Dr. Kirk also that you can go to the boards of education of this State, of New York or Pennsylvania, and tell them that they must provide a special course adequate for dental students. The lawyers and the physicians may come in and say the same thing, and a great many other callings may say so also. I do not think the boards of education of any State will make a special course to correspond with the demands or wishes of the dental profession. We do not need that, but we do need an education that will make men come up worthy of the calling of lawyers,

worthy of the calling of the medical men or any other profession; that will give them the qualifications of men and of whom we can say, "This is a *man*, qualified by his early education to be such, and therefore fit to enter dentistry, medicine, law, or any other profession to which he may be called; qualified not only by his education but by his moral training as well." There is no calling in the world, be it law, medicine or anything else where it is so necessary that the moral training shall be right as in dentistry. Think about it one minute, and you will say that I am right. If we can get this qualification up to where it belongs and ought to be, you can say with me that dentistry has kept pace with the progress of this wonderful age. (Applause.)

Dr. Jarvie. Dr. Stockton misunderstands me. I did not say that New York would provide any such course. I said that if such a course was suggested by this body it would be respectfully considered by the educational authorities of New York State. I did not go further than that.

Dr. Ottolengui. May I point out to Dr. Stockton that the same preliminary manual course added to the high school system, as advocated by Dr. Kirk, which would fit a man to go into a dental college properly equipped to begin his duties, would equip him for the medical or legal profession, because as I understand it is a training of the mind to properly understand science when it comes to it.

Dr. J. T. Hart, New York. Mr. President: The consideration of Professor Kirk's paper brings us to the inquiry: "Where shall the barrier be established?" I firmly feel that the manual training which it is so essential students shall receive, should be given to them before they enter the dental college. I think that the barrier should be placed at the entrance to the college. It is very unfortunate for any student after being admitted to a college to find that his educational requirements are deficient; that he is manually unfit to practice the profession which he has chosen. I fully concur with one of the latest speakers when he says that the manual training course added to the high school education will benefit so many others besides those who purpose studying dentistry, that I do not think the educational authorities will object to adding that to the course.

Dr. Kirk. I should like to say a few words. I am very grateful for the very general discussion that this topic has brought out, but I fear from a mental survey of the ideas presented by those who have done me the honor to discuss the subject that I may have been misapprehended at one or two points. I endeavored to confine the discussion, especially in the

matter of manual training, to its value as a means of mental culture. The dental college course will supply, I think, a sufficient amount of manual dexterity. That is not what we are after at all. We can supply that; but we cannot, with the curriculum as it is now loaded down, put into a man who has not those qualities originally, as the result of his preliminary training, that mental condition which I have epitomized as correct methods of thinking and reasoning. The general course is not long enough or full enough to do that, nor is it especially directed toward that point. That is something a man should have when he comes to us. If he has that then he will be what Dr. Stockton has rightly stated as necessary to a dentist, that he will be not only an educated individual, but will be a man.

Perhaps I can make my point a little clearer by following the example of some of the other gentlemen who have spoken, and telling a story.

A Horse Story.

My friend, Dr. Cryer, sold me within a year a thoroughbred mare; she was all that Dr. Cryer claimed she would be. This was one of the instances in which I bought a horse which was as represented. Nevertheless, she was unbroken at the time of purchasing. She was four or four and a half years old, and had never been handled, beyond being "halter broken." The system of education which was developed by that relationship was a double one—the mare became educated along certain lines, and so did I! I, knowing nothing about the education or breaking of horses, turned her over to an expert to complete her education, and she was returned to me with the statement that her education was finished. I drove her twice; the first time with a great deal of comfort and satisfaction. On the next trip she kicked a hole through the dashboard of the wagon, and nearly demolished the vehicle, and I returned her to the man, who was an entirely competent handler of horses, with the statement that the horse's education was evidently not finished up to the standard that I required. He took her again and spent two months of time in a very persistent effort to correct her faults, and I then took her again as finished. I found in driving her that she had a peculiar habit of resisting whenever compelled to do anything. For example, in going up a hill something did not seem to suit her, and she was inclined to balk. I sent her back again, and the trainer said: "Dr. Kirk, she is a very peculiar animal; she is a thoroughbred, and you never can count on them, they will always be a little queer; they are hot headed and not satisfactory, as a rule, for a man to drive." I said to him: "I don't think you have broken that horse; she has been educated, she knows a lot of things, but she has not been broken as I understand it. Does she know everything she ought to know?" He said: "She knows everything except backing; she does not know how to do that." I said: "Very well, you

take her again, and give her a lesson in backing." He was quite despondent about it, because his reputation was at stake, and he was a very capable man in his line. After he had given her a lesson in backing I met him, and he said: "I spent just one and a half hours in teaching that beast to back; part of the time I was in the vehicle attempting to back her, and part of the time I was at her head, and every time she would rear up on her hind legs. She went over backwards three times; finally she went all to pieces. You can do anything you like with her; she is absolutely broken."

There was the point; there was the manual training idea. He put that horse through a technical problem; teaching her to back was purely incidental. What he did was to teach her the lesson of obedience, the backing was merely an incidental matter. She knew how to do everything, but was not willing to obey, and the mental characteristic which it was necessary to put into that horse's mind was absolute obedience. She might know how to do fifty things, but if she refused to do them she would be useless, and the lesson she learned from the manual training system was the spirit of obedience rather than how to back. It is the lack of that principle in the preliminary education of the dental student that, as I tried to point out in my paper, is the greatest obstacle we have to contend with in training men as dentists. They have not been taught the principles which go to the formation of certain mental attributes with regard to their work sufficiently so that when we come to superimpose the practical training upon their preliminary training, it is adapted to it.

With regard to the formation of a high school course, which shall be adapted to our students, that is a very simple thing. I had no idea of suggesting that we go to the superintendent of education and say: "So shape your curriculum of study in the high school that we shall have a special course adapted to the needs of dental training," by no means, but, "Give us a certain group of studies which shall have a broad application to a great many professions." That is a very simple matter. We have solved that problem in Pennsylvania in this way: We shall require at the end of this session a high school graduation. We have had to come to it gradually because it would be a drastic measure to make a jump from nothing at all to that high standard. But at the next session we reach that point, and at that time will receive such diplomas from entering students as a sufficient evidence of their preliminary training. But we do not admit that all of those high school diplomas are the best for that purpose. We know that is not true, because graduates of certain high schools succeed with us and others do not. That is a simple problem; if a man is ready to take his dental course he reacts in a certain way, and we produce a certain result; if he is not fit he does not. But in lieu of such

diploma we admit a standard of preliminary training which is tested by an examination, which examination covers a group of studies which, if the man passes in them successfully, will admit him to what we call the mechanical engineering course of the college department, and give him an equivalent to a college entrance. And that particular group of studies, we believe, if a man passes through them successfully, will fit him for mechanical engineering for dentistry, or a number of things that require, as dentistry does especially, that habit of mind which I have designated as the habit of correct, accurate and precise thinking and reasoning about his work. We can give him the technical part afterwards, but he must have that mental attitude toward his work. We think such a course can be prescribed; we have put it into operation, and we believe it will do what we expect it to do. (Applause).

Report of Committee in Relation to Dentists in the Army.

Dr. William L. Fish. Mr. President and gentlemen, as a prelude to the report which I propose to present tonight on the appointment of dentists in the army, I will state that there is about to be presented to Congress a bill providing for the establishment of a dental corps in the United States Army. The National Association has appointed a committee to that end. The project of the National Association is that 100 contract dentists be appointed immediately for the United States Army. I am opposed to that on grounds which the lateness of the hour precludes my stating. My own opinion in regard to the matter is that the United States Army should be provided with a dental corps composed of a lieutenant colonel and a major, whose duties shall be purely executive, and to each of the fifteen or sixteen departments there shall be one captain and two lieutenants. I realize the fact that in order to make this corps effective the members of the dental corps shall be commissioned officers. It is a recognized fact that no private in the army will respect any one except an officer. They respect purely the shoulder straps, nothing more, and to make this an effective corps we must have our men commissioned officers. Therefore, I am opposed to the bill which is now being prepared, providing for 100 contract dentists, and to the end that we might have a few statistics to present before the National Committee, I have drawn up the following report:

As a member of the committee appointed to aid in the passage of a bill for the establishment of a dental corps in the army, I beg leave to submit the following report of progress:

Realizing the need of statistics and data in presenting this subject

before Congress, I addressed a communication to Lieutenant Tully McCrae, Fort Wadsworth, N. Y., requesting permission to examine the teeth of the men of his garrison. I received a reply granting my request, and to that end I secured the co-operation of Dr. C. W. F. Holbrook, of Newark, member of the committee appointed by the National Dental Association. Together we visited Fort Wadsworth on Friday afternoon, November 17. Colonel McCrae received us courteously, and assured us of his approval of the project. Accompanied by an orderly we visited the quarters of Batteries M and O, where such men as were not on duty or otherwise engaged presented themselves for inspection. Owing to lack of time we were able to examine but fifty non-commissioned officers and men. The result of this examination is as follows:

Eleven men had what might be called a perfect set of dentures; of these eleven five were new recruits; the balance had been in the service from one to five years. We therefore found 39 men out of 50 in absolute need of dental services. Nine of the thirty-nine men were practically raw recruits, who are supposed to have a perfect set of dentures on entering the service. We found from a very superficial examination the presence of 144 cavities that needed immediate attention; how many more there were that escaped our view no one knows. In many cases where caries existed, the pulps were exposed, and the men complained of toothache to a greater or less degree. Forty teeth had been extracted while in the service. When we take into consideration the present conditions, it is safe to assume that over 50 teeth will have to be removed from those mouths in the next year.

The foregoing facts give but a faint idea of the absolutely neglected condition of the men, so far as it pertains to dental services. We had an opportunity to learn their sentiment upon the subject, and found them unanimously of the opinion that they needed a dentist more than a doctor.

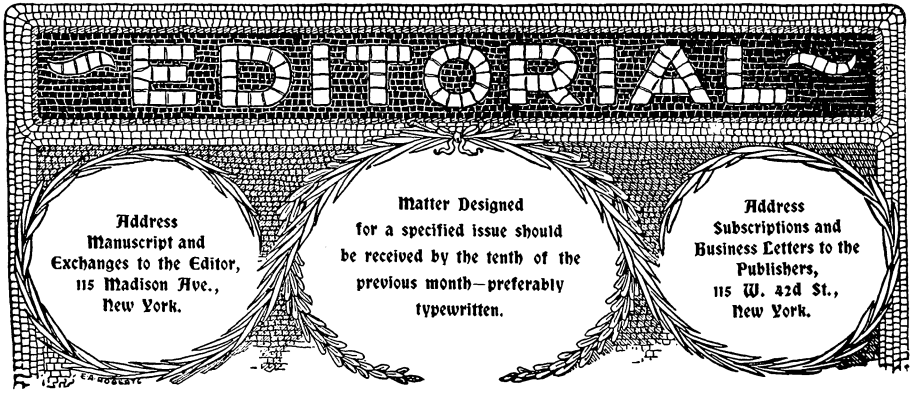
While examining the men in M battery the cook was brought in, and asked to be relieved of an aching molar. We were informed that men were frequently compelled to ask to be relieved while on guard, owing to toothache. Many incidents were related that would be of interest, but lack of time precludes their repetition here.

In closing I would say that the time has arrived for the dentists of the country to take united action in this matter. To that end I would ask every man present to use all the influence in his power with his Senator and Congressman to secure the passage of this measure in the interest of humanity and our profession.

This is a matter that deserves the united support of every member of our profession. If any of you had gone to Fort Wadsworth and seen the condition existing in the mouths of these men, who today are our coun-

try's defenders, you would give your hearty co-operation in any effort that would bring about the establishment of a dental corps in the United States Army, and if there are any here who know senators or members of Congress it behooves them to solicit their support.

On motion of Dr. Meeker, it was resolved that the chairman of the above committee and as many members as possible proceed to Washington at the opening of Congress in aid of the proposed measure.



Fight the Crown Company.

Since December 1st of last year the dental profession of this country may be said to be divided into two classes: those who belong to the Dental Protective Association and those who do not, the date mentioned having been set as the limit of time for the acceptance of members. The Crown Company is busily engaged collecting money from those dentists who are foolish enough to settle, their efforts being chiefly directed against those who have not joined the Protective Association, though strange to say they have met with a limited success among some who are members, notably in the State of New Jersey.

It will be recalled that when the last court decision in their favor was announced, glaring headlines in the press told of the millions in royalties which would now be collected. The gleaning of the harvest, however, seems to be yielding only about a pint to the bushel. The following is a copy of a settlement recently made with one of the New Jersey dentists:

Copy of Settlement with Crown Company.

Memorandum of Agreement between the International Tooth Crown Company, a corporation organized and existing under the Laws of the State of New York, party of the first part, and..... ...., New Jersey, party of the second part:

Whereas, The said International Tooth Crown Company is the owner of certain Letters Patent heretofore granted for inventions and improvements in Artificial Dentures or Dental Processes, including the following, to wit:

United States Letters Patent, No. 238,940, dated March 15, 1881; No. 245,872, dated August 16, 1881; No. 224,355, dated February 10, 1880; Nos. 277,934, 277,935, 277,936, 277,937, 277,938, 277,939, 277,940, 277,941, 277,942, 277,943, all dated May 22, 1883; No. 282,119, dated July 31, 1883; and No. 357,044, dated February 1, 1887; and

Whereas, the party of the second part is desirous of obtaining from the party of the first part a general release from all claims arising out of infringements of said patents, or any of them, and also of obtaining from said Company the right and privilege of using said inventions and improvements in Artificial Dentures, according to the specifications of said Letters Patent,

Now, Therefore, This agreement Witnesseth, that in consideration of the sum of Twenty-five Dollars ($25.00) to the party of the first part in hand paid by the party of the second part, the receipt whereof is hereby acknowledged, the said International Tooth Crown Company, the party of the first part, has remised, released and forever discharged, and by these presents does for itself, its successors and assigns, remise, release and forever discharge the said party of the second part, his heirs, executors and administrators, of and from all claims or causes of action which it may now have by reason of infringements of said patents or any of them, and does hereby grant unto the party of the second part the right, privilege and license, under each of said Letters Patent (excepting such as may have expired) to use the said inventions thereby patented for the production of Artificial Dentures in his own business as a dentist and for his own patients, and to vend the Artificial Dentures so produced to his said patients, during the remaining existing term thereof only, free from all claims or restraints on the part of the party of the first part.

In Witness Whereof, the International Tooth Crown Company has hereunto caused its name to be subscribed and its corporate seal to be affixed this.....day of....., 189..

THE INTERNATIONAL TOOTH CROWN COMPANY,
By Lucien T. Sheffield, President.

Witness:
Jas. H. Stewart,
Nov. 28, '99.
Mary E. Meeker.

It is a grievous error for any member of the Dental Protective Association to buy such a release from the Crown Company even at the low price of twenty-five dollars. It is wrong because it gives the Crown Company an increase of funds, thus helping them to harass other members of the profession. But the chief wrong is that it sets up a precedent of recognition of the justice of their claims. This will operate against us in

two ways. The moneys collected from dentists by the vulcanite rubber people undoubtedly served as the impetus in the formation of the International Tooth Crown Company, which Phœnix-like arose from the ashes of the defunct predecessor. If the Crown Company should succeed in extracting any large sum of money from the pockets of the dentists, there is no doubt that other companies will be formed, and other patents sought with the hope of levying blackmail in the guise of license and royalties. The more important injury, however, will be the effect upon the Patent Committees of Congress, who must consider during this session our bill, which asks for relief against this patent incubus by an enactment prohibiting the granting of patents of objectionable character.

The Weakness of the Crown Company's Case.

It is true that for the moment the Crown Company has an apparent advantage through a decision in their favor, which they will not too hastily test by further litigation with the Dental Protective Association, well knowing that, properly considered, the decision will be reversed. Their method is to send agents around with offers of compromise, hoping to obtain money from dentists through their dread of the expense and delays of litigation. That they should be willing to give a release for all claims against a dentist for so small a sum as twenty-five dollars shows how little hope they have of collecting royalties in full through recourse to the courts, and also how unwilling they are to have a real test of their claims. It is safe to say that whatever threats they make, few if any suits will be brought against those who defy their agents. There are two points in connection with their claims which it will be well for the dentists to fully understand. In the first place their agents declare that they will collect royalties upon all operations performed since the granting of their patent, the amount of these royalties to be decided by an examination of the books of the dentist. Secondly, they state that these royalties will be at the rate of fifteen per cent of the fees charged.

In Regard to a Dentist's Books.

The first declaration alarms those who are conscious of having performed many crown operations, all of which have been duly entered in their books. But a brief conversation with a lawyer will show how preposterous this idea is. A suit for the collection

of royalties, under the claim of infringement of patent rights is what is known as a suit in equity. The plaintiff must prove his own case; that is, he must establish upon *prima facie* evidence that he has good cause for believing that infringement has occurred. This done, he may demand, and the court may allow, an examination of the defendant's books as a means of ascertaining the sums rightfully due. It should be observed that the language here used is that "he may demand, and the court may allow." It is equally true that the court may not allow the examination of the books. In other words, the plaintiff does not possess an inherent right to examine the defendant's books, but must first set up a case sufficient to satisfy the court that infringement has occurred, whereupon the court would most probably order the production of the books. But most positively the court would not permit the plaintiff to establish his claim solely by examination of the books of the defendant, for this would be the equivalent of compelling the defendant to convict himself, by aiding the plaintiff in establishing his case. In the specific circumstances which we are discussing, it would, for example, be needful for the plaintiff, that is to say, the Crown Company, to explain to the court the nature of their patents and in what way they expect to show that infringement had occurred; next they would be obliged to bring some evidence in substantiation, as, for example, a witness who would swear that such work had been done by the defendant for him; or a former assistant who would testify that he had seen such work performed by the defendant. If evidence of this character were not combated, the judge might order a production of the books; but then again, he might not. Thus each case would be tried on its merits and in no case could the Crown Company demand the books as a right.

A Point in Relation to Royalties.

The Crown Company declare that they will or can collect fifteen per cent royalty on all operations covered by their patents. There is practically no doubt of their absolute inability to do this. There is a point to be made here which is somewhat complex, but it is a fine point, and will prick the bubble of the Crown Company's preposterous claims. There is a fundamental principle in the application of patent law that "royalties must be equable." That is to say the holder of a patent cannot let it out to one person at one rate and to another at a

higher rate. Moreover, it has been decided that in a contest for settlement for royalties, the claim must be based upon the lowest royalty that has been accepted. The Crown Company probably imagine that in fixing a uniform rate of fifteen per cent as their royalty claim they have established an equable mode of settlement, but in this they err, because of the peculiar nature of their patents. This can only be made plain by citing examples of the application of royalties to patents. Suppose that a man owned a patent on a peculiarly-constructed all-gold crown, which was to be placed on the market as a manufactured product. He could contract with a manufacturer to permit the latter to make and sell his crowns on a royalty of, say, fifty cents on each crown sold; or the agreement might be for fifteen per cent of the selling price of each crown, the price of sale being fixed and agreed on. In this, it is to be observed, the product is definite, and the selling price and royalties are also definite.

With a patented method of procedure, however, it is different. For example, if a patent should cover a certain method of making shoes, the owner of the patent could demand from those who make shoes by his method a royalty of, say, fifteen cents on each pair of shoes, but he could not demand fifteen per cent upon the selling price of each pair of shoes. Why? Because the price of the shoes depends not upon the fact that they were produced by his method, but rather upon the business ability of the manufacturer to obtain a higher price for his product than others could. In applying this principle to dentistry it is even more intelligible.

Dr. Jones is a dentist, recently graduated. He is thoroughly competent, but he is at the beginning of his career. He modestly fits up an office on a side street and slowly attracts patients. He places a Richmond crown on a tooth, and charges ten dollars for his service. In another section of the same city is an old-established dentist, Dr. Smith. He is in the most stylish neighborhood, pays a high rent, and has built up by long and patient work a *clientele* among the wealthy residents. He also makes a Richmond crown, and he charges fifty dollars for it. Now the agents of the Tooth Crown Company hale both of these gentlemen into court, prove their cases, and demand settlement. From Dr. Jones they ask for fifteen per cent of ten dollars, and accept one dollar and a half in settlement. From Dr. Smith they demand fifteen per cent of fifty dollars, or seven dollars and fifty cents. Would that be justice? Would the court allow

it? It would not be justice, and the court would not allow such a claim.

Let us analyze the situation. If the Crown Company render these two men a service by providing a method of crowning a tooth, is not the service to one as great as, and no greater than to the other? Then why should they collect seven dollars and fifty cents from Dr. Smith when they were satisfied with one dollar and fifty cents from Dr. Jones?

How and for what does Dr. Smith obtain his fifty-dollar fee? It has taken him years of good work in the community to obtain the confidence of the richer element, and they pay him large fees because they feel assured that they will receive extra-skilled services. Thus whilst Dr. Jones can obtain only ten dollars for his application of the crowning system, Dr. Smith receives fifty, the extra forty dollars representing what he obtains over Jones for his own individual work, in which the Crown Company can have no legal interest. After the least consideration it is manifest that it would be a gross injustice for the Crown Company to have an interest or practically a fifteen per cent partnership in one line of a man's business merely because they own a patent upon a method which he may employ.

The moral of this is that if it can be shown that the Tooth Crown Company has ever accepted a small sum in royalties, no larger sum per tooth can be collected by them legally. Thus, if some quacks using their methods have placed crowns at two or three dollars each, as many advertise to do, from thirty to forty-five cents per tooth is all that they could collect, and the fifteen per cent claim is a mere bugaboo with which to frighten the timid. Therefore our advice is to fight the Tooth Crown Company, since they have no case.

Dentists in the Army.

The following is a copy of the bill introduced in Congress at the request of the committee of the National Association:

56th Congress, 1st Session. **H. R. 972.**

IN THE HOUSE OF REPRESENTATIVES.

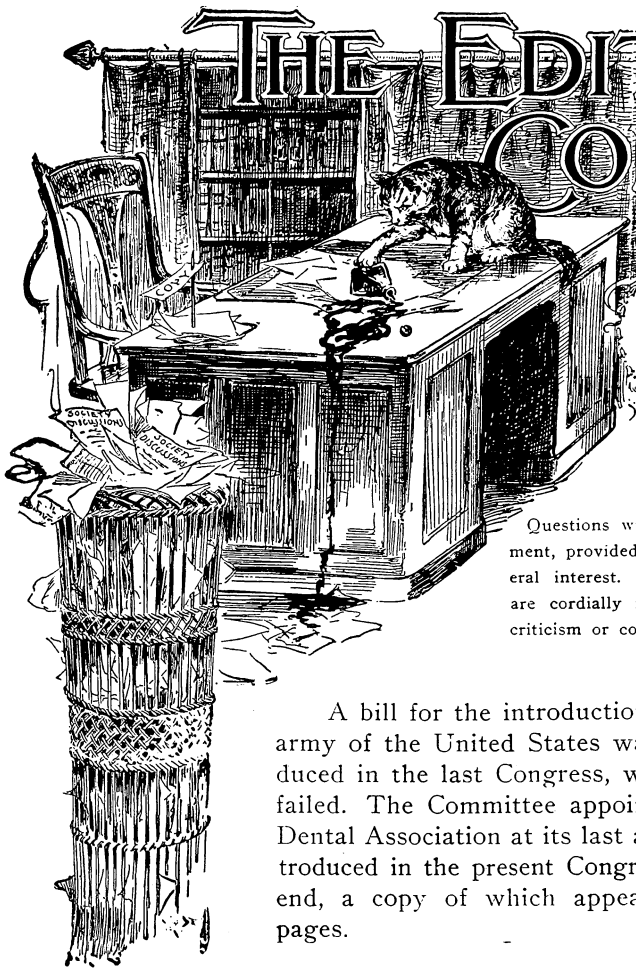
December 5, 1899.

Mr. OTEY introduced the following bill; which was referred to the Committee on Military Affairs and ordered to be printed.

A Bill

To provide for the appointment of dental surgeons for service in the United States Army.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Surgeon-General of the Army, with the approval of the Secretary of War, be, and he is hereby, authorized to employ and appoint dental surgeons to serve the officers and enlisted men of the Regular and Volunteer Army in the proportion of one dental surgeon to every one thousand of said Army. Said dental surgeons shall be employed as contract dental surgeons, under the terms and conditions applicable to army contract surgeons, and shall be graduates of standard medical or dental colleges, trained in the several branches of dentistry, of good moral and professional character, and shall pass a satisfactory professional examination: *Provided,* That three of the number of dental surgeons to be employed shall be first appointed by the Surgeon-General, with the approval of the Secretary of War, with reference to their fitness for assignment, under the direction of the Surgeon-General, to the special service of conducting the examinations and supervising the operations of the others, and for such special service an extra compensation of sixty dollars a month shall be allowed. *Provided further,* That dental college graduates now employed in the Hospital Corps, who have been detailed for a period of not less than twelve months to render dental service to the Army and who are shown by the reports of their superior officers to have rendered such service satisfactorily, may be appointed contract dental surgeons without examination.



THE EDITOR'S CORNER

With malice toward none, with charity for all

Questions will be answered in this department, provided the answers would be of general interest. After publication our readers are cordially invited to make further reply, criticism or comment.

Dentists in the Army.

A bill for the introduction of dentists into the army of the United States was prematurely introduced in the last Congress, with the result that it failed. The Committee appointed by the National Dental Association at its last annual session has introduced in the present Congress a bill to the same end, a copy of which appears elsewhere in our pages.

It will undoubtedly be a disappointment to many who read the bill to note that all that is asked is that contract dentists be authorized, the original and natural desire of our profession being to see dentists established as officers, similarly with the medical corps. The Committee, however, have arduously worked in this cause and are cognizant of so many obstacles in the path of a regular commissioned corps of dentists that they have finally and wisely decided to attempt only that which would not be certain to fail. The defeat of another dental measure would relegate the cause to oblivion for many years, whereas the adoption of the Committee's bill would at least mean the practical

trial of the project, with the very possible result that as soon as the usefulness of dentists to the army had been fully felt, much of the present objection would subside and a commissioned dental corps would be more readily attained than now. In such a condition of affairs preference in the appointments would surely be given to those who had well acquitted themselves as contract dentists and who would by then have become familiar with the needs of the soldiers. Immediately upon reading the bill, our subscribers are requested to write one or more letters, one at least, to their Congressmen. Make these letters brief, but express some good reason why the bill should be passed, and request a reply. These replies from Congressmen should be forwarded to this office, addressed to the editor, who is a member of the National Committee. In this manner it is hoped that we will sound the Congressmen and be able to decide whether or not to press the bill to a vote. No time should be wasted. In referring to the bill give the number.

Reduction of Postage on Manuscripts.

The Society of American Authors has undertaken to obtain a reduction in the postage rate now charged on manuscripts. The explanation of this movement, which we heartily indorse, and the reasons for the request are thus stated in the Society's Bulletin:

"There are in this country slightly over 20,000 men and women who, outside of editors and employees, strive to live by the pen. Taken in its entirety the mental activity of this class has placed our country in the forefront of the world for literary productivity. Yet to the few only are there any rewards commensurate with the toil and the thought and the strain that are the lot of those who feel within them the literary compulsion.

"Viewed from without the item of postage may appear a minor matter. Viewed, however, from within it is one of the major burdens of the writer. Frequently manuscripts, whether long or short, have to traverse the anxious way, back and forth, many times before they find a resting place in the printed page. In every case the burden of sending and securing a return is on the author. When, however, the article is accepted and the publisher returns it for proof-reading, it can travel for one-quarter the rate of postage borne by the unaccepted manuscript.

"The test of civilization is the extent to which men and women of many minds can cheerfully co-operate in matters of mutual interest. Each writer, therefore, is requested to do two things immediately.

"First.—Write a personal letter to the Congressman of the district and to the Senators of the State urging all three to remove every possible obstacle from the way of the bill that will be presented to Congress this

winter in favor of entitling authors' manuscripts to be mailed at third-class rates. (Two ounces for one cent.)

"Second.—Immediately write a letter to the Society of American Authors, 71 Broadway, New York, granting permission to the Society to use the name and influence of the writer in the petition to Congress that will be presented at the same time as the bill. Owing to the preliminary work that has been done and in full expectation of a hearty effort on the part of those who receive this printed matter, the Society has confidence to believe that the United States will, during the coming session of Congress, decide to stand abreast with England in relation to this important matter.

Death Under Nitrous Oxide.

The following paragraph, clipped from the New York *Herald* of December 18, 1899, records a death attributed to administration of nitrous oxide gas:

"WATERBURY, Conn., Sunday.—George F. Terrell, master mechanic for the American Pin Company, took his twelve-year-old son, Andrew, to the office of Dr. Virgil Munson, a dentist, this afternoon. The boy was suffering severely from an aching tooth—one of the big molars. He refused to submit to the operation without an anaesthetic, and was given nitrous oxide, known as laughing gas.

"The tooth came easily, but the boy died within a few minutes. The Doctor says there was apparently no physical reason why the youth could not stand the anaesthetic, but friends of the boy are dissatisfied."

Treatment of Nose Bleed.

Gallaher describes the following method of arresting nasal hemorrhage: A piece of cotton as large as the patient's little finger is taken and a piece of string six inches long is tied to its center. The cotton is then introduced through the anterior nares until it is free in the nasopharynx, gentle traction is then made on the string until the cotton is engaged in the posterior nares, which can be told by resistance or by direct vision. I then blow in an antiseptic powder, and pack, against the plug, sterilized gauze as we pack to the front. The string should be wrapped around the index finger of the operator, and he should make sufficient traction to hold the posterior plug in place, lest the plug be dislodged and forced into the nasopharynx, defeating our purposes. When we have packed to the anterior nares a pledget of cotton will be all that is needed. In cases in which the hemorrhage has not been alarming, it is well to remove the plug in twenty-four hours. In graver cases it may be left for forty-eight hours, without much danger of producing acute inflammation of the middle ear. The packing should be removed with the utmost care, and in nearly every case its removal is not followed by additional hemor-

rhage. I first thoroughly saturate the gauze with an antiseptic solution, such as boracic acid, following this up with an injection of 2 per cent solution of cocaine, using it from time to time during the removal of the gauze. I also inject an oily solution such as liquid vaseline. When the posterior plug is reached an additional injection of the oil should be made; then the plug can be gently pulled through the nose by the string which has been kept in front and in the inferior meatus, the oily injection having lubricated the parts. At least ten or fifteen minutes should be taken to remove the plug. In case the plug is not easily dislodged, which is very seldom, it may be pushed back into the nasopharynx, first having additional string tied to the string already in place. The plug may be then removed by the forceps or drawn down and coughed out by the patient himself. This method cannot be used in cases of great obstruction in the nostrils and in that case he introduces a soft rubber catheter with a string at its end, catching the catheter in the nasopharynx and drawing it out through the mouth. Then a pledget of cotton is tied to the string and pulled through the posterior nares, the nostril being packed with gauze as well as cotton. In cases of deflected septums occluding the anterior nares, a piece of cotton may be tied to a string, pushed back of the palate and placed in the posterior nares with the finger. He has never seen this complication, but it may occur.—*The Journal.*

To Remove the Odor of Iodoform from the Hands.

Dr. Ricketts is authority for the statement that vinegar applied freely to the hands after they have been cleansed with soap and water will effectually remove the odor of iodoform.—*Medical Review.*

Disinfection of the Mouth.

C. Roese announces that numerous—about 264—tests with various disinfectants for the mouth have convinced him that 50 per cent alcohol is not only powerfully bactericidal—as others have established—but that it has a specific healing effect on the diseased mucous membrane of the mouth, producing an arterial fluxion, under the influence of which the venous stasis of the diseased gums disappears and they return gradually to normal. It is impossible to rinse the mouth effectively with it on account of the smarting of the roof and sides of the mouth, but the gums are less sensitive, and his method of applying it is to have the tooth-brush dipped in the alcohol. He urges chemists to devise some preparation for a tooth cream combined of alcohol, precipitated chalk and an appropriate antiseptic.—*Muench. Med. Woch., Sept. 5.*

W. G. A. Bonwill.

Meeting of American Graduates at Sydney, New South Wales, to Express Sympathy at the Untimely Death of Dr. Bonwill.

A meeting of American Graduates resident in New South Wales was held at the offices of Dr. E. R. Magnus, Liverpool Street, Sydney, on November 20th last, to express their feeling of esteem in which the late Dr. Bonwill was held amongst them.

Dr. Alfred Burne occupied the chair, and amongst those present were Dr. E. Randolph Magnus, Dr. Frank Magnus, Dr. Carter, Dr. Arthur Cox, Dr. Oscar Davis, Dr. Hinder, Dr. Stanley Rea, Dr. Nathan, Dr. MacTaggart and others. Apologies were received from many unable to attend owing to distance and short notice of meeting.

The following resolution was put and carried unanimously:

"That we, American Graduates resident in N. S. W., desire to place on record our feeling of the great loss sustained by the dental profession through the untimely death of Dr. W. Bonwill, whose good work will long live on to testify to his great ability, and his name will ever remain a landmark in the history of dentistry. We also desire to express our deep sympathy with those members of his family who are left to mourn their loss."

Dr. Burne, in feeling words, spoke of the many acts of kindness shown him by the late Dr. Bonwill, and also of the great loss that dentistry had suffered in losing such a skilful dentist, and in conjunction with the late Dr. Garretson, two of the most brilliant lights in the dental world. He felt that every Graduate must well remember the clinics given by the late Doctor, which (speaking personally) remained ever green in his memory.

Dr. Hinder, in moving the resolution, was unable to express his sympathy in fitting terms for the great loss sustained. Dr. Nathan seconded the resolution.

Dr. Arthur Cox, Dr. Stanley Rea, and Dr. E. R. Magnus also spoke of the many personal acts of kindness received from the Doctor.

A vote of thanks to the Chairman closed the meeting.

H. Taylor, Hon. Sec.

Academy of Stomatology of Philadelphia, Pa.

The Committee on Resolutions upon the death of Dr. Bonwill beg leave to submit the following:

Whereas, W. G. A. Bonwill, D. D. S., a member of the Academy of Stomatology, has been removed by death, it becomes our mournful duty to make a record of his worth; therefore, be it

Resolved, As the sense of this society that in the death of Dr. Bonwill the Academy has lost a distinguished member and the dental profession one of its best-known followers.

As a man Dr. Bonwill was genial and affable, though often misunderstood. As a dentist he was skilful and conscientious. As an inventor he had no superior in the dental profession. As an enthusiastic worker in the field of dental advancement he had few equals.

Entering upon the study of dentistry at an early age and under pecuniary disadvantages he worked his way to success and eminence by burning zeal and untiring industry. His temperament was such that he could not be idle, and while others slept he was awake and working out problems which have made his name famous throughout the dental world.

As fellow comrades, marching to the eternal world, we shall miss Dr. Bonwill from our ranks. Let us, therefore, loiter for a moment on the busy highway of life to hang one garland on his tombstone.

Resolved, That a copy of these resolutions be engrossed upon the records of the Academy and additional copies sent to his family and the dental journals.

Committee,

EDWIN T. DARBY, Chairman.
JAMES TRUMAN.
I. N. BROOMELL.
HARRY B. HICKMAN, Secretary.

E. G. Hazelton.

Dr. E. G. Hazelton, of Kenosha, Wis., after a lingering illness of six weeks with typhoid fever, passed away on Oct. 22, 1899.

Dr. Hazelton was born in Fowler, N. Y., in 1844, and at the time of his death was fifty-five years old. He moved to Kenosha thirty-two years ago and has ever since been identified with the first social and business interests of the town. He was a member in Masonic circles, and was the

organizer of the first water system in use in Kenosha, being the principal stockholder and manager of the company for many years.

The doctor had seen much of the growth and prosperity of Kenosha, and for years was a moving, active spirit in all that pertained to the general welfare of the town. For five years past he had borne much of the brunt of the failure of the Dan Head & Co. bank, and to this and the worry attendant thereto is ascribed the breaking down of a once vigorous system. Through it all he labored zealously to save depositors, and if possible retain their confidence. The work was great and it told on him, and when disease took hold of him it found his system weak from the toil he had given to the work that he undertook for the good his fellow man and his good name.

While the doctor's death was not unexpected, hope of his recovery was still entertained almost to the end. While the blow is hard to the afflicted widow and daughter, yet both they and his host of friends have much to be grateful for, since the end came so quietly and peacefully. The community mourns his loss.

New York Odontological Society.

The thirty-second anniversary of the above society will take place at the Academy of Medicine, Tuesday, January 16, 1900, at 2 and 8 p. m.

At the afternoon session, commencing at 2 o'clock, Dr. Joseph Head, of Philadelphia, will give a clinic: Inserting a Porcelain Inlay, using an entirely new cement. Immediately after the clinic Dr. Head will read a paper, subject, "Shadow Problems as Presented by Porcelain Inlays."

The evening paper by A. W. Harlan, M. D., D. D. S., of Chicago, subject, "A Review of Recent Literature on the Loose Tooth or Pyorrhea Problem."

Executive Committee,
DR. C. B. NASH,
DR. F. T. VAN WOERT,
DR. W. W. WALKER, Chairman.
58 West Fiftieth Street.

The Alumni Association, Dental Department, University of Buffalo.

The Alumni Association, Dental Department, University of Buffalo, desires to announce that "Alumni Day" will be held on Friday and Saturday, January 26 and 27, 1900, at the college building, No. 25 Goodrich street, Buffalo, N. Y. R. Ottolengui, M. D. S., will give thorough and practical clinics in porcelain filling, and deliver an address before the association. There will be other interesting clinics, and it is desired to make the meeting of value to every practitioner present. A general invitation is extended to dentists, and the program and further information may be obtained by addressing J. W. Beach, D. D. S., 680 Main street, Buffalo, N. Y.

Kentucky State Dental Association.

The next annual meeting of the Kentucky State Dental Association will be held in the City of Louisville, on the 15th, 16th and 17th of May, 1900. We are already assured of the best meeting in the history of the association. Aside from an attractive programme, the meeting of the National Confederate Association in Louisville at the same time enables us to procure a one cent per mile railroad rate from over the greater portion of the United States. There will be many other attractions to the dentists who attend; trips to the wonderful Mammoth Cave, and to the Blue Grass Region of Kentucky. Ample accommodations at reasonable rates have already been obtained. For further information address

F. I. GARDNER, Secretary,
213 West Chestnut Street,
Louisville, Ky.

Cedar Rapids Dental Society.

The following interesting subjects will be discussed at the regular monthly meetings of the Cedar Rapids Dental Society:

January—A Neglected Field in Dentistry. T. A. Gormley, Mount Vernon.

February—Dental Medicines and Their Uses. J. H. Calder.

March—Antral Complications. H. L. Walker.

April—Orthodontia. Prof. Brady, Iowa City.

May—Subject to be Selected. F. P. Burchell, Marion.

June—Nerve Cases and Complications. J. B. Pherrin, Central City.

Come and discuss these subjects relating to incidents in practice.

E. EBI, President.
C. B. WHELPLEY, Secretary.
C. D. HOLLENBECK, Treasurer.

Ohio State Dental Society.

At the last meeting of the Ohio State Dental Society the following were elected officers for 1900:

President, L. L. Barber, Toledo; first vice-president, H. F. Harvey, Cleveland; second vice-president, Otto Arnold, Columbus; secretary, S. D. Ruggles, Portsmouth; treasurer, C. I. Keely, Hamilton.

S. D. RUGGLES, Secretary.

Southern California Dental Association.

The second annual meeting of the Southern California Dental Association was held in Los Angeles, on Oct. 3 and 4, in the college building of the Dental Department of the University of Southern California.

The session was called to order at 9 a. m., with President W. A. Smith of Los Angeles in the chair.

Prayer—Dr. R. W. Morris, Los Angeles.

President's address—Dr. W. A. Smith, Los Angeles.

The True Position of Our Profession—Dr. H. Gale Atwater, Downey, Cal.

Discussion opened by Dr. F. M. Parker, Los Angeles.

The Electric Root Dryer as a Sterilizer of Pulpless Teeth and Lactate of Silver in the Treatment of Alveolar Abscess—Dr. W. H. Moore, Santa Barbara.

Discussion opened by Dr. A. H. Palmer, Pasadena.

The afternoon sessions were devoted to clinics.

Tuesday Evening, October 3.

6 p. m.—Banquet, followed by theater party.

Wednesday, October 4.

9 a. m.—Educational Work—Dr. J. D. Moody, Los Angeles.

Discussion opened by Dr. Evangeline Jordan, Los Angeles.

Popular Dental Education—Dr. G. A. Millard, Oxnard.

Discussion opened by Dr. R. W. Morris, Los Angeles.

The Potency of Favorite Dental Antiseptics—Dr. Edgar Palmer, Los Angeles.

Discussion opened by Dr. W. C. Smith, Pasadena.

Assemble Hall—3:30 p. m.—Question Box.

Business Session—The following officers were elected for the ensuing year:

President—H. R. Harbison, D. D. S., San Diego, Cal.

Vice-President—L. N. Bedford, D. D. S., Redlands, Cal.

Second Vice-President—Emma T. Read, D. D. S., San Diego, Cal.

Secretary—L. E. Ford, D. D. S., Los Angeles, Cal.

Treasurer—Dr. J. M. White, Los Angeles, Cal.

The meeting then adjourned to meet in October, 1900, at Santa Barbara.

During the meeting a committee of three members was appointed, consisting of Drs. R. W. Morris, W. H. Moore and G. A. Millard, to confer with the Boards of Education of the different counties, in regard to

having this association appoint dentists to make an annual examination of children's mouths between the ages of six and ten years, they to be furnished with one diagram, so that their parents might know in what condition their mouths were at this important period, and another diagram to be kept for statistical purposes.

Another committee was appointed, consisting of three members, Drs. H. Gale Atwater, F. M. Parker, and L. E. Ford, to unite with other associations and societies throughout the country in securing the appointment of dentists in the army.

A legislative committee of five members was appointed, consisting of Drs. F. R. Cunningham, W. M. Garnett, F. M. Parker, A. H. Palmer, of Pasadena, and R. F. Phillips, of San Diego.

This was the largest and most enthusiastic meeting ever held in Southern California, forty new applications being received for membership. The association now consists of ninety active members, and one honorary member.

L. E. FORD, Secretary.

Missouri State Board of Dental Examiners.

Article II. Section 1.—All colleges operating in this State must comply with the rules as stated in Article I. of the "Rules for Colleges." Also with the following demands of this board, before their graduates will be granted a board certificate.

1st. Students applying for admission to a dental college in this State, who cannot present a certificate as required by Rule 2, of Article I., shall then submit themselves to an examination as indicated in Rule 2, Article I.

2d. These examinations must be conducted by a person appointed by the State Superintendent of Public Instruction, through the secretary of the board.

3d. It shall be the duty of the person conducting these examinations to make a verified report to the Dean of the college, giving applicant's full name and average grade made by each applicant, and to the secretary of each board a duplicate report with each applicant's examination papers, which shall be kept by the secretary for a period of four years, subject to inspection at any time.

4th. The average grade of an applicant shall be 70 per cent. before he can be admitted to any dental college in the State of Missouri.

5th. It shall be the duty of the secretary of this board to notify the Dean of the colleges, whose applicants have been examined, of those who have made the required grade, and are entitled to enter the college as students in the Freshman year class.

6th. The Deans of colleges admitting students into the Junior or Senior year classes, must in each case make a verified statement to the secretary in regard to the qualifications upon which each student was admitted.

Rule 2, Article I., sets up the standard of admission certificate of entrance into second year high school, etc.

7th. All expenses incurred in examination of students must be paid by their respective colleges.

8th. It shall also be the duty of this board to elect two of its members each year to inspect the dental colleges in this State, and they must make a written report at the May meeting of the board as to their equipment and teaching qualification.

Any further information as to the details of the examination will be furnished upon application.

Yours truly,

CLINTON, MO. S. C. A. RUBEY, Secretary.